PB89-153829

Superfund Record of Decision (EPA Region 5)
Coshocton Landfill, Coshocton, Ohio
June 1988. First Remedial Action

(U.S.) Environmental Protection Agency
Washington, DC

17 June 88

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EPA/ROD/R05-88/067
June 1988

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EPA

Superfund Record of Decision:

Coshocton Landfill, OH

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Coshocton City Landfill (CCL), an 80-acre landfill, is located in Franklin Township, Coshocton County, Ohio. The landfill is built on abandoned, subsurface strip mines, where an extensive network of mine shafts were developed. CCL is located between two small intermittent creeks that drain toward the Muskingum River, 1.5 miles to the west of tne site. The area is characterized by considerable topographic relief, with small streams situated between steep rolling hills. Most of the surrounding land is either woodlands or pasture land used for cattle grazing. The landfill property was used in the early 1900s, and again from the mid-1950s until mid-1979, for subsurface shaft mining of coal. The city conducted landfill operations at the site between 1968 and 1979; however, the operations were not well recorded. The waste received at the landfill consisted of mixed municipal refuse and industrial wastes including relatively inert solid scrap wastes, nonhazardous materials, and hazardous liquid waste types such as spent chlorinated solvents, non-chlorinated flammable solvents, resins, and prasticizers. Much of the landfilled waste is situated in the void created by abandoned strip mine operations. Some waste was also reportedly placed in shallow excavations in the southern portions of the site. Currently, portions of the landfill site are covered with what appears to be mine spoil materials. The cover on the site

(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
Coshocton Landfill, OH
First Remedial Action - Final
Contaminated Media: gw, sw
Key Contaminants: metals (arsenic), organic (PAHs), VOCs (TCE)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 90
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16. ABSTRACT (continued)

however is, not consistent, with little or no cover in some areas. In addition, standing water is observed in several areas. Scattered surface deposits of drums and other metal objects are present at the site. Numerous leachate seeps exist on portions of the landfill. The primary contaminants of concern affecting the surface and ground water at this site include: carbon disulfide, TCE, PAHs, chlorinated and non-chlorinated solvents, and heavy metals (mostly arsenic).

The selected remedial action for this landfill includes: installation of a 2-foot low permeability soil cap over the landfill, with top soil and vegetation; imposition of deed restrictions, including fencing; filling and grading the necessary areas; and possible installation of a gas collection and venting system, as well as a leachate collection system and a drainage layer. This remedial action will also include routine ground and surface water and sediment monitoring to identify changes in contamination concentrations. The implementation of this remedial action will entail a capital investment of $8,010,000 with a present value of O&M cost of $910,000 associated with the remedy.

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Record of Decision

Site Name and Location
Coshocton City Landfill
Coshocton, Ohio

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Coshocton City Landfill site developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan to the extent practicable.

This decision is based upon the contents of the administrative record for the Coshocton City Landfill site.

The State of Ohio concurs on the selected remedy.

Description of the Remedy

The selected remedial alternative for the Coshocton City Landfill site is to cover the landfill with a low permeability cap and undertake other actions required by State sanitary landfill closure requirements. The major components of the selected remedial alternative are:

- Complete site fencing and posting
- The recordation of notice in the chain of title regarding uses to which the property has been put, and any restrictions on its future use, referred to herein as "deed restrictions"
- Site grading to promote precipitation runoff and reduce infiltration
- Site capping which meets State solid waste landfill requirements and which minimizes leachate generation and prevents direct contact with contaminated materials
- Top cover of topsoil and revegatation
- Site monitoring including groundwater monitoring, surface water monitoring and landfill gas monitoring to determine the effectiveness of above measures and to provide early alert as to the need for other actions

The following components will be evaluated during the Remedial Design (RD) and will be included if necessary:

- Landfill gas collection and venting system
- Leachate and groundwater collection and on-site storage system with facilities for truck loading
- Provisions for on-site or off-site treatment and disposal of collected leachate and groundwater at a local POTW (The Coshocton POTW was used for evaluation and cost estimation)

Consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, I have determined that, at the Coshocton City Landfill site, the selected remedial alternative is cost-effective, provides adequate protection of public health, welfare and the environment, and utilizes treatment to the maximum extent practicable.

The action will require operation and maintenance activities to ensure continued effectiveness of the remedial alternative as well as to ensure that the performance meets applicable State and Federal surface and groundwater criteria.

I have determined that the action being taken is consistent with Section 121 of SARA. The State of Ohio has been consulted and concurs with the selected remedy.

Declaration

The selected remedy is protective of human health and the environment and attains Federal and State requirements that are applicable or relevant and appropriate to this remedial action and is cost effective.

This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not employ treatment as a principal element of the remedy.

Because this remedy will result in hazardous substances remaining on-site, a review will be conducted within five years after commencement of remedial

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action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Valdas V. Adamkus
Regional Administrator

June 17, 1988
DATE

I. SITE NAME, LOCATION, AND DESCRIPTION

The Coshocton Landfill is located on approximately 80 acres in the east half of Section 3, Franklin Township, Coshocton County, Ohio, 3.5 miles southeast of the City of Coshocton, Ohio. Site access is by an unimproved road south of State Highway 83.

The Coshocton Landfill is located between two small intermittent creeks that drain toward the southwest into the Muskingum River, 1.5 miles west of the site. Within a quarter mile of the site, topographic relief exceeds 200 feet, the elevation varies from about 800 to 1,000 feet msl.

Coshocton County is on the western edge of the Appalachian Plateau. The area is characterized by considerable topographic relief with small streams situated between steep hills. The topography is steeply rolling; level land available for tillage is primarily in the river valley bottom lands.

Active, abandoned, and reclaimed coal strip mines are scattered throughout the region. Coshocton Landfill is built on abandoned, strip-mined land. Until early 1986, an active coal strip mine was operating to the immediate east of the site. Much of the land to the south and to the west of the site has been mined and reclaimed.

The uplands area around the landfill is sparsely populated. Homes are generally associated with small farms. Drinking water in the area is supplied by individual private wells. The steep topography in the immediate vicinity of the landfill limits the use of the surrounding land for agriculture. Most of the land is either woodlands or pasture land used for cattle grazing. Livestock have been observed using the two small intermittent creeks as a source of drinking water.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The earliest documented economic development activity at the Coshocton Landfill property was subsurface shaft mining of the Middle Kittanning Coal in the early 1900's. An extensive network of mine shafts was reportedly developed under portions of what is now the landfill property, but the full extent and date of termination of mining activities are unknown.

Portions of the landfill property were strip mined for further removal of the Middle Kittanning Coal from the mid-1950's until mid-1979. In July 1978, the City of Coshocton signed a coal lease with the Conotton Land Company, which subsequently relinquished the mineral rights to Cravat Coal Company. Cravat Coal Company has mined portions of the Coshocton Landfill property.

During strip mining, overburden and coal were removed to track the No. 6 coal seam into the hillside. The stripping operation removed material down to the base of the Middle Kittanning Coal seam that occurs across the site at approximately elevation 870 to 860 feet msl. Historical air photos show that the overburden or mine spoils were deposited behind the active mining operation, in areas where overburden and coal had already been removed. This was typical practice for strip mining in the area.

Mining probably ceased at the Coshocton site when the over-burden thickness rendered coal recovery uneconomical. When mining ceased, an exposed steep rock face known as the "high wall" remained.

At the conclusion of mining operations, portions of the gap between the spoil bank and high wall filled with water from groundwater or surface water, creating what are known as "spoil ponds". At least four spoil ponds existed along the abandoned high wall at the Coshocton Landfill site as of 1965. One of these spoil ponds remains and is located west of the site just outside the City of Coshocton property line.

ENFORCEMENT HISTORY

On March 30, 1984, U.S. EPA issued a unilateral administrative order to the City of Coshocton requiring it to undertake some interim measures, primarily to protect surface water and to address the leachate being generated. (V-W-84-C-006)

On November 29, 1984, U.S. EPA determined that the City's proposal, with amendments specified by EPA, complied with the terms of the order. By letter dated April 16, 1986, U.S. EPA agreed to relieve the City of its obligation to perform quarterly sampling.

III. COMMUNITY RELATIONS

The Remedial Investigation (RI) and Feasibility Study (FS) were put out for public comment on February 8, 1988. The Administrative Record, which included the Endangerment Assessment (EA), was added on February 25, 1988. The comment period was extended twice and closed on March 17, 1988. All of these materials, including the proposed plan, were available for review at the Coshocton Public Library.

A public meeting was held on February 23, 1988. A presentation on the RI and FS was made and then a question and answer session, as well as an opportunity for making public comments, was held. Public comments were also submitted to U.S. EPA by mail. A Responsiveness Summary to these comments was compiled and it is attached.

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The selected remedial alternative for the Coshocton City Landfill is to cover the landfill with a cap. Unless the continued monitoring at the site identifies additional problems which need to be addressed, this will be the final remedy for the site. The cap which is placed on the site in conformance with the State sanitary landfill closure requirements, should prevent any migration of the hazardous substances which have been identified as having been placed in the landfill.

V. SITE CHARACTERISTICS

During active operation, the landfill accepted a variety of industrial wastes, including hazardous substances from several local industries. Based on data from city files and information submitted by local industries as reported in the endangerment assessment, materials listed below were accepted as drummed waste liquids:

- Alcohol
- Acetone
- Epoxy resin
- Phenolic resin
- Melamine resin
- Xylene
- Perchloroethylene
- Mineral spirits
- Plasticizers
- Neoprene

Other industrial solid waste disposed of at the site included rotocyclone scrubber dust, plastic particles, paper coloring pigments (brown iron oxide, calcium carbonate, chrome green, and tan iron oxide), paraffin wax, sawdust, waste-activated sludge, scrap plastic, scrap rubber, floor sweepings, and miscellaneous trash.

VI. SUMMARY OF SITE RISKS

The Coshocton Landfill site is releasing contaminants to the environment. The major release mechanism is leachate migrating to surface water. However, the extent of the leachate's migration to ground water is unclear. Results of samples taken from leachate, ground water, surface water, and sediment identified approximately 30 chemical constituents. Based on this as well as other data relevant to the site, indicator chemicals identified at the site include 2-butanone (methyl ethyl ketone), carbon disulfide, 1,1-dichloroethane, polynuclear aromatic hydrocarbons (PAH), 1,1,1-trichloroethane, pentachlorophenol, heptachlor and heptachlor epoxide, phthalates, toluene, vinyl chloride, xylene, copper, nickel, and zinc. The fate and transport information, as it relates to groundwater, indicates that for the inorganics, arsenic, copper, nickel, and zinc, sorption will be the main process that will influence their migration. Nickel is expected to be the most mobile of this group. Of the organics,

2-butanone, carbon disulfide, toluene, and xylene may move with the bulk water flow, but are subject to biodegradation; phthalates, PAHs, and heptachlor may sorb to particles and not move with the bulk water flow; and vinyl chloride may move with the bulk flow. In surface water, the inorganics are subject to sorption and complexation; sorption may decrease mobility while complexation may increase mobility. The organics that will most likely volatilize form surface water are 2-butanone, carbon disulfide, 1,1-dichloroethane, 1,1,1-trichloroethane, toluene, vinyl chloride, and xylene. Phthalates, PAHs, and heptachlor are expected to sorb to particles and deposit in the sediments.

The following risks were identified at the site:

A. Ingestion of Contaminated Ground Water

Incremental carcinogenic risks from the ingestion of ground water exceeded a risk of 1E-06 based on the maximum concentrations for the following contaminants: Upper aquifer-arsenic (3E-04) and bis(2ethylhexyl) phthalate (4E-06).

The levels of all contaminants, which have MCLs established and were identified at the site, were below these MCLs. MCLs are considered protective of human health and are the maximum amount of these contaminants allowable in drinking water.

B. Ingestion of or direct contact with contaminated Surface water

Incremental carcinogenic risks from the ingestion of surface water exceeded a risk of 1E-06 for arsenic (3E-06) only.

Concentrations of some constituents in the surface water and sediment were close to chronic concentration values of concern for aquatic life, but these chronic concentration values were not exceeded.

C. Ingestion of or direct contact with contaminated leachate

Incremental carcinogenic risks from the ingestion of leachate was below 1E-06 for all contaminants.

D. Ingestion of contaminated soil

Incremental carcinogenic risk from the ingestion of soil exceeded a risk of 1E-06 only for arsenic (3E-06) when pica behavior was assumed.

VII. DISCUSSION OF CHANGES FROM PROPOSED PLAN

CERCLA Section 117(b) requires that the final selected remedial action plan be accompanied by a discussion of any significant changes from

the proposed plan and of the reasons for such changes. U.S. EPA has received additional information since the publication of the proposed plan, which it has reviewed and analyzed together with information which was already in its possession.

Such new information and data received by the Agency in response to the publication of the proposed plan include the following:

1. A letter dated March 16, 1988 was received from Richard L. Shank, Director of the Ohio Environmental Protection Agency, commenting on the Feasibility Study. That letter clarified the Ohio Solid Waste regulations as they pertain to the type of material which may be used to construct a barrier over a solid waste landfill, the depth of cover which must be applied over the barrier, whether a sand drainage layer is necessary, whether a gas ventilation system is required to be constructed, and whether a leachate collection system is appropriate at this time. Generally, the Director recommended that a determination as to each of these issues be deferred to the remedial design stage of the process.

2. A copy of a letter dated August 28, 1980 from Richard Anderson, Project Engineer for General Electric, to Deborah J. Berg of the Ohio EPA with accompanying analytic test results, and a copy of a letter in response, dated December 16, 1980, from Berg to Anderson, were obtained. Said correspondence indicates that the waste generated by General Electric referred to as "Roto Clone Sludge" was determined by Ohio EPA to be "non hazardous". Since large volumes of this waste were disposed of in the Coshocton Landfill, such a determination has implications for whether regulations and standards governing hazardous wastes or those governing solid wastes are more "appropriate" in selecting a remedy for this site.

Given this new information, U.S. EPA reviewed and analyzed some of the information already in its possession. Specifically, it revisited the "applicable or relevant and appropriate" issue, as discussed herein. In general, the state's clarification of its solid waste regulations and the factoring of the roto-clone sludge information into an analysis of the relative volumes of hazardous and solid wastes, all support a modification of the proposed remedy.

VIII. DESCRIPTION OF ALTERNATIVES

Alternatives 1 (AA-1) thru 5 (AA-5) were described in the Proposed Plan. As a result of the public comments and a review of the alternatives with regard to those comments, a new alternative which will be referred to as the "chosen alternative", was developed. The chosen alternative is described between alternative 3 and alternative 4, hereafter.

Alternative 1 (AA-1) is the no action alternative. This alternative will not provide protection for the public health or the environment. The substantial threat of release of contaminants that may present an imminent and substantial danger to public health and welfare and the environment would remain because there is reasonable evidence that there are substantial quantities of hazardous substances and pollutants remaining in the waste mass. These substances could pose a threat to public health if released and public exposure should occur. Alternative 1 would not meet applicable State landfill closure and post-closure care regulations.

Alternative 2 (AA-2) incorporates legal deed restrictions, fencing and posting for the property. Groundwater, surface water and sediment would be monitored on regular bases.

AA-2 addresses the risks associated with soil contact through deed restrictions to prohibit excavation for future development and fencing to restrict and reduce the probability of direct soil contact. AA-2 would not reduce infiltration and potential future transport of contaminants from the landfill contents. Groundwater monitoring would be focused on metals, selected indicator parameters, and selected organic priority pollutant and Hazardous Substances List (HSL) compounds. The specific list of metals and organic compounds to be monitored would be determined by U.S. EPA in cooperation with OEPA. Sediment and surface water monitoring would also be aimed at triggering appropriate responses if releases increase in the future.

Fencing requires routine maintenance for prolonged useful life. Monitoring would be effective in detecting water quality changes and identifying the need for future protective response actions, as appropriate.

AA-2 addresses current and future exposure risks. However, AA-2 is similar to no action in that the substantial threat of release of contaminants that may present an imminent and substantial danger to public health and welfare and the environment would remain. There is reasonable evidence that there are substantial quantities of uncontrolled hazardous substances and pollutants remaining in the waste mass. These substances could pose a threat to public health if released and public exposure occurs.

AA-2 has no major O + M requirements for process or structural performance. Fencing would require routine O + M.

AA-2 would not meet applicable State solid waste landfill closure regulations.

Alternative 3 (AA-3) consists of soil filling and grading with topsoil and revegetation at the site. AA-3 also includes the same deed restrictions and site fencing included with AA-2. Groundwater, surface water and sediment would be monitored regularly.

Filling and grading the site would effectively reduce the possibility of direct contact with the landfill waste mass. Soil cover and grading would reduce the infiltration percolation through the waste mass and, therefore, reduce the transport of contaminants. Deed restrictions and fencing would support and strengthen the effectiveness of the soil cover in limiting direct contact.

The site cover and grade require regular maintenance to remain protective. The useful life of the site cover would depend on proper O+M to maintain the finished grades against the effects of erosion and settlement. With proper O+M, the protectiveness of the cover should last indefinitely.

Routine monitoring of groundwater, surface water, and sediment would be effective in identifying changes in contaminant concentrations and causes for possible future protective response actions. Monitoring of groundwater is important to periodically check the effectiveness of the site cover installed.

Alternative 3 would not meet applicable State solid waste landfill closure regulations.

The Chosen Alternative consists of a 2 foot low permeability soil cap of the landfill, with a top soil cover and revegetation. This alternative also includes the deed restrictions, fencing, filling and grading and the monitoring program incorporated into AA-3. During Remedial Design (RD) the system would be evaluated for the need to include gas collection and venting, leachate/groundwater collection and disposal, and a drainage layer. Capping would effectively reduce the possibility of direct contact with the landfill contents. The cap would substantially reduce contamination transport caused by percolation of infiltration through the waste mass. Deed restrictions and fencing would support and strengthen the protectiveness of the capping in limiting direct contact.

The site cap would require regular maintenance to remain protective. The useful life of the site cap would depend on proper O+M, the protectiveness of the cap should last indefinitely.

Routine monitoring of groundwater, surface water, and sediment will be effective in identifying changes in contamination concentrations and causes for possible future protective response actions. Monitoring of groundwater is important to periodically check the effectiveness of the capping system installed.

The chosen alternative would meet all State solid waste landfill closure regulations, as well as all other applicable or relevant and appropriate requirements (ARARs).

Alternative 4 (AA-4) consists of a comprehensive capping of the landfill property. The capping system used as the basis for the cost

estimate of AA-4 was a clay, soil and sand system, which would include gas collection and venting and leachate/groundwater collection and disposal. AA-4 also includes deed restrictions, fencing, filling and grading, and the monitoring program incorporated into AA-3.

Capping would effectively reduce the possibility of direct contact with the landfill contents. The cap would substantially reduce contaminant transport caused by percolation of infiltration through the waste mass. Deed restrictions and fencing would support and strengthen the protectiveness of capping in limiting direct contact.

The site cap would require regular maintenance to remain protective. The useful life of the site cap would depend on proper O+M, the protectiveness of the cap should last indefinitely.

Routine monitoring of groundwater, surface water, and sediment is effective in identifying changes in contaminant concentrations and causes for possible future protective response actions. Monitoring of groundwater is important to periodically check the effectiveness of the capping system installed.

AA-4 also incorporates a landfill gas venting/collection system to prevent gas accumulation under the cap and a leachate collection system at the toe of the slope to prevent fluid pressure from building up under the cap and to control releases of potentially contaminated leachate/groundwater. Both the gas and leachate collection systems would be periodically monitored to determine the need for possible future protective response actions such as treatment additions or modifications.

Alternative 4 would meet all ARARs.

Alternative 5 (AA-5) consists of capping with a multilayer cap system incorporating a synthetic membrane as typically used for RCRA closure at an existing facility. The capping system used as the basis for the cost estimate of AA-5 was soil, synthetic membrane, and clay. AA-5 also includes deed restrictions, fencing, filling and grading and the monitoring program incorporated into AA-3 and AA-4.

Capping would effectively reduce the possibility of direct contact with the landfill contents. The membrane cap system would substantially reduce contaminant transport caused by percolation of infiltration through the waste mass. Deed restrictions would support and strengthen the protectiveness of capping in limiting direct contact.

The site cap will require regular maintenance to remain protective. The useful life of the site cap would depend on proper O+M. With proper O+M, the protectiveness of the cap should last indefinitely.

Routine monitoring of groundwater, surface water, and sediment would be very effective in identifying changes in contaminant concentrations and causes for possible future protective response actions. Monitoring of groundwater is important to periodically check the effectiveness of the capping system installed.

AA-5 also incorporates the same gas vent and leachate collection systems as AA-4. Both the gas vent and leachate collection systems would be periodically monitored to determine the need for possible future protective response actions such as treatment.

AA-5 would meet all ARAR's.

IX. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A. Overall protection of human health and the environment.

Alternative 1 would not be effective in protecting either human health or the environment.

Alternative 2 would provide some protection from direct contact through fencing and disturbance of the subsurface through deed restriction.

Alternative 3 would provide protection from direct contact and would help prevent groundwater and surface water contamination.

The chosen alternative, alternative 4 and alternative 5 would provide increasing protection from direct contact, groundwater and surface water contamination.

B. Compliance with ARARs.

SARA requires that remedial actions meet legally applicable or relevant and appropriate requirements of other environmental laws. These laws may include: the Toxic Substances Control Act, the Safe Drinking Water Act, the Clean Air Act, the Clean Water Act, the Solid Waste Disposal Act (RCRA), and any state law which has stricter requirements that the corresponding federal law.

Applicable requirements are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a site. A requirement is "applicable" if the remedial action or circumstances at the site satisfy all of the jurisdictional prerequisites of the requirement.

Relevant and appropriate requirements are cleanup standards, standards of control, and other environmental protection requirements, criteria or limitations promulgated under Federal or State law that, while not legally "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to that site.

"A requirement that is judged to be relevant and appropriate must be complied with to the same degree as if it were applicable. However, there is more discretion in this determination: it is possible for only part of a requirement to be considered relevant and appropriate, the rest being dismissed if judged not to be relevant and appropriate in a given case" (Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements, 52 FR 32496, August 27, 1987).

1. Landfill Closure Requirements

The regulations promulgated pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Sections 6901, et. seq., are not "applicable" to this site. The RCRA regulations which govern Hazardous Waste Treatment, Storage and Disposal facilities (40 CFR Parts 264 and 265) did not become effective until November 19, 1980. The Coshocton Landfill ceased accepting wastes prior to that date.

Those RCRA regulations addressing solid waste disposal activities (40 CFR Parts 241 and 256, primarily) do not have direct application to individual facilities but rather provide for an enforcement program to be administered by the states pursuant to a Solid Waste Management Plan.

Though RCRA regulations are not jurisdictionally applicable to the remediation of the site, they are certainly "relevant" to the actions occurring thereon. Both subtitle C of RCRA, which applies to hazardous waste activities and facilities, and subtitle D of RCRA, which applies to Solid Waste Facilities, have a logical bearing upon a landfill which contains both hazardous and solid waste materials.

Though both Subtitle C and Subtitle D are relevant to the remedy for the Coshocton Landfill, the Subtitle D provisions relating to capping/covering the landfill are deemed more appropriate. (None of the alternatives under consideration involve excavation, physical redistribution or treatment of the waste so as to make those subtitle C regulations which are applicable to "management" of waste). The appropriateness determination is dependent on whether substantive requirements are meant to address

sufficiently similar circumstances as those present at the specific site to make them particularly well suited to that site. It is, of necessity, a case by case determination relying on the opinions and judgment of experts, as well as on objective information and evidence.

The following factors were considered in reaching a conclusion that the Subtitle C capping/cover requirements are not appropriate for this site:

1. Estimated proportion of reported hazardous substances to total landfill waste.

2. General toxicity and mobility of the reported hazardous substances constituents.

3. Results of the endangerment assessment.

Estimated Hazardous Substances Proportion. The proportion or fraction of reported hazardous substances to total landfill wastes was estimated. The estimate was based on calculated landfill volume, reported wastes disposed by six major local industries (assumed to be hazardous based on the descriptions given in the CERCLA Section 104(e) responses) and estimated densities for the landfill materials and hazardous substances.

The estimated proportion ranged from 0.7 to 1.3 percent with an estimated maximum fraction of 2.4 percent by weight. This range and maximum were calculated by adjusting assumptions on the variables in the estimates.

General Toxicity and Mobility. The industrial wastes considered hazardous were mostly described as spent chlorinated solvents, waste dirty oil, paint sludges including cleaning solvents and caustic sludges. Many of these wastes would now be listed "F wastes" or meet the RCRA definition of ignitible, i.e., characteristic hazardous wastes.

The spent chlorinated solvents included trichloroethylene (TCE) and methylene chloride. Both solvents are relatively mobile in groundwater. TCE has a MCL of 5 ppb (ug/L) and a MCLG of 0 ppb (ug/L) based on suspected carcinogenicity.

The other flammable solvents (including mineral spirits, xylene, toluene and methyl ethyl ketone) are considered mobile and are not suspected carcinogens and have relatively low toxicity compared with some of the chlorinated solvents.

Paint sludges and caustic cleaning sludges are relatively immobile. Some leaching of heavy metals could be expected but this would tend to occur relatively slowly as the paint sludges deteriorate.

Results of the Endangerment Assessment. The endangerment assessment did not find a pattern of release from the landfill that was causing current unacceptable risks to human health or the environment.

In summary, Subtitle C landfill closure requirements are not deemed appropriate for the following reasons:

a. The majority of total wastes deposited was general municipal garbage, industrial refuse and inert yard-type trash (tree stumps and demolition debris). The estimated fraction of drummed hazardous substances was less than 2.5 percent by weight.

b. Some of the specific hazardous substances are suspected carcinogens, however, most of the reported hazardous substances were relatively low toxicity flammable materials.

c. The site does not show a pattern of hazardous substance release causing a demonstrated risk to human health or the environment based on the endangerment assessment.

However, Subtitle D provisions are deemed appropriate to that portion of the chosen remedy requiring that the site be covered to protect against direct contact with the waste and to minimize the production of leachate and discharges to ground and surface water. Said provisions are embodied as "Guidelines" at 40 CFR Part 241. In order to meet the requirement of section 241.209-1 that cover material be applied "to minimize fire hazards, infiltration of precipitation...", section 241.209-3 recommends that "the thickness of the compacted final cover should not be less than 2 feet".

It should be noted that the subtitle D guidelines were enacted in 1974 and that amendments reflecting experience gained in the intervening years are anticipated in the near future. Moreover, the existing guidelines assume the landfill wastes to be that generated by residential and commercial sources. They advise that "If techniques other than the recommended procedures are used, or wastes other than municipal solid wastes are disposed, it is the obligation of the proposed facility's owner and operator to demonstrate to the responsible agency in advance by means of engineering calculations and data that the techniques employed will satisfy the requirements". 40 CFR 241.100(b)

As a part of the public comment process, a group of PRPs has proposed an alternate remedy for the site. To the extent such

alternate remedy may be considered, Subtitle D indicates that engineering calculations and data should be provided which demonstrate that such alternative will as effectively minimize infiltration of precipitation as the recommended procedures.

There are no "applicable" state hazardous waste regulations since no hazardous materials were disposed of in the landfill subsequent to the promulgation of the Ohio Hazardous Waste Management regulations in 1981. For the reasons enunciated previously in the discussion of the appropriateness of Subtitle C and Subtitle D of RCRA, the state's hazardous waste regulations are not addressed to circumstances sufficiently similar to these site conditions to make them "appropriate".

However, the State of Ohio does have Solid Waste Disposal Regulations (Ohio Administrative Code, Chapter 3745) which are applicable to this site, and which were identified in a timely manner. (See correspondence from Ohio EPA to U.S. EPA dated August 18, 1987, November 5, 1987, and March 16, 1988). The regulations were adopted on July 29, 1976 and were in effect during times when the Coshocton Landfill was in operation. Moreover, correspondence obtained from state records indicates that said landfill has never been properly closed pursuant to the Ohio regulations, specifically section 3745-27-10.

The chosen alternative is intended to be consistent with the State Solid Waste regulations. The PRP group has proposed an alternate remedy, as a part of the public comment process, which on its face does not appear to satisfy the State regulations. However, the State regulations contemplate a waiver of specific regulatory provisions if an applicant demonstrates that under specific terms and conditions the facility will not harm the public health or the environment, OAC § 3745-27-11. If during the remedial design stage or during consent decree negotiations the PRP group demonstrates that an alternate closure design would satisfy the requirements of such a waiver under state solid waste regulations, U.S. EPA may consider modifying the chosen remedy, if it determines that such an alternate plan is equally protective.

2. Other Requirements

If a leachate collection system and/or a gas venting system is determined to be necessary during the design process, applicable and relevant and appropriate standards will be complied with for all systems. These may include the following:

Law, Regulation or Standard	Source of Regulation
Safe Drinking Water Act Maximum Contaminant Limits (MCL's)	Safe Drinking Water Act, 40 CFR 141 through 143
Intergovernme National Pollutant Discharge Elimination System (NPDES) Permit	CWA Section 402, 40 CFR 122, 123, 125 Subchapter N
Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403 Subchapter N, FWPCA
Occupational Safety and Health Act (OSHA)	29 CFR 1910
STATE	
Ohio NPDES Permit	OAC 3745-31-05 (A) (3)
Ohio NPDES Regulations	Ohio Administrative Code: 3745-33-01 through 3745-33-10. Authority granted by Ohio Water Pollution Control Act, ORC 6111.03.
Ohio Water Quality Standards	Ohio Administrative Code: 3745-1. Authority granted by Ohio Water Pollution Control Act, ORC 6111.041.
Ohio Pretreatment Regulations	Ohio Administrative Code: 3745-3. Authority granted by Ohio Water Pollution Control Act, ORC 6111.03.
Ohio Water Pollution Control Act	Ohio Revised Code: 6111.01 to 6111.08.

Law, Regulation, or Standard	Source of Regulation
Ohio General and Miscellaneous Air Pollution Regulations	Ohio Administrative Code: 3745-15-04.
	Ohio Administrative Code: 3745-15-07.
	Ohio administrative Code: 3745-15-08.
Ohio Air Pollution Control Laws	Ohio Revised Code: 3704.03.
Ohio regulation on Air Permits to Operate and Variances	Ohio Administrative Code: 3745-35

C. Long-term effectiveness and permanence

Alternative 1 would not be effective in addressing contamination from the site.

Alternative 2 would provide only limited long term effectiveness and would require long-term care of the fence.

Alternative 3, the chosen alternative, and alternatives 4 and 5 would provide increasing effectiveness as the quality of the cap is improved.

All would require long-term maintenance in order to retain their effectiveness.

D. Reduction of toxicity, mobility or volume

None of the alternatives will reduce the toxicity or volume of the wastes at the site because all landfill waste will remain in place.

Alternative 1 and 2 will have no effect on the mobility of the wastes.

Alternative 3, the chosen alternative, and alternatives 4 and 5 are all designed to reduce the mobility of the wastes. As the quality of the cap is improved in moving from the alternative 3 to alternative 5 the reduction in mobility becomes more effective.

Water Balance calculations by assembled alternative

Alternative	Runoff (in/yr)	Percolation (in/yr)
No action AA-1 and AA-2	6.1	21.3
Surface Controls AA-3	10.1	4.3
Chosen Alternative	10.1	2.2
Soil-Clay Cap AA-4	10.1	2.2
Soil-Membrane-Clay Cap AA-5	10.1	0.3

E. Short-term effectiveness

Alternative 1 would not be effective in addressing contamination from the site.

Alternative 2 would help restrict access to the site once the fence is completed. It would also monitor conditions at the site.

Alternative 3, the chosen alternative, and alternatives 4 and 5 would cause short term impacts due to construction of the cap. These would include noise from heavy equipment, dust and increased chances for direct contact with wastes by construction personnel.

F. Implementability

All of the alternatives are readily implementable. The chosen alternative, and alternatives 3, 4 and 5 utilize proven techniques for capping the landfill. The leachate collection and gas venting techniques used for alternatives 4 and 5 and potentially the chosen alternative are also commonly used and proven techniques.

G. Cost

COST ESTIMATE SUMMARY

AA-1 No action (Cost estimates not applicable)
AA-2 Site Restrictions
AA-3 Site Grading

Chosen Alternative Soil and Clay Capping
AA-4 Soil and Clay Capping
AA-5 Soil, Synthetic Membrane, and Clay Capping

Description	AA-2	AA-3	Chosen Alternative	AA-4	AA-5
Sitework	$0	$3,800,000	$2,850,000	$6,190,000	$6,190,000
Clay Barrier	$0	$0	$2,060,000	$2,060,000	$2,060,000
Geomembrane	$0	$0	$0	$0	$1,250,000
Leachate/Groundwater Collection Storage and Treatment	$0	$0	$0	$475,000*	$475,000
Gas Collection	$0	$0	$0	$374,000*	$374,000
Health and Safety	$0	$23,000	$46,000	$46,000	$57,000
Deed Restriction/ Fencing	$176,000	$176,000	$176,000	$176,000	$176,000
Design, Contingencies and Other Costs	$251,000	$3,080,000	$2,880,000	$6,950,000	$7,800,000
Total Capital Cost Estimate	$427,000	$7,080,000	$8,010,000	$16,300,000	$18,400,000
Annual O + M Cost Estimates	$69,500	$82,000	$96,000	$129,000	$129,000
O + M Present Worth (10% interest, 30-yr)	$655,000	$773,000	$910,000	$1,220,000	$1,220,000
Total Present Worth	$1,080,000	$7,850,000	$8,920,000	$17,500,000	$19,600,000

* These items are potentially included with the cost estimate for the chosen alternative if determined to be necessary by OEPA during the design.

H. Support Agency Acceptance

The Ohio EPA has indicated that it fully supports the chosen remedial alternative. A letter from the director of the Agency indicating this support is attached.

I. Community Acceptance

The community appears to be divided on the benefits to be derived from a protective remedy. Because the City of Coshocton is one of the PRPs, many of the taxpayers in the City oppose the expenditure of the funds required for alternative 4. The citizens of Coshocton do not feel that the threat identified in the Endangement Assessment supports the expenditure of substantial amounts of city tax money. The people who live near the landfill, however, are strongly in favor of a protective remedy, whatever the cost.

X. SELECTED REMEDY

The selected remedy has the following major components:

- Complete site fencing and posting
- Recordation of Notice in the chain of title designating the site as a restricted use property, used to manage hazardous waste
- Site grading to promote precipitation runoff and reduce infiltration
- Site capping which meets State solid waste landfill requirements and which minimizes leachate generation and prevents direct contact with contaminated materials
- Top cover of topsoil and revegatation
- Monitoring of groundwater, surface water and landfill gas to determine effectiveness of above measures and to provide early alert as to the need for other actions

The following components will be evaluated during the Remedial Design (RD) and will be included if required:

- Landfill gas collection and venting system

- Leachate and groundwater collection and on-site system with facilities for truck loading

- Provisions for on-site or off-site treatment and disposal of collected leachate and groundwater at a local POTW or on site treatment

XI. STATUTORY DETERMINATIONS

A. Protection of Human Health and the Environment

The remedy selected is based on potential future endangerment to public health, welfare and the environment. Site file records provide reasonable evidence that substantial quantities of hazardous substances and pollutants exist in the landfill waste mass. The substantial threat of release of these materials may present an imminent and substantial danger to public health, welfare and the environment if these substances were released and public exposure occurred.

The chosen alternative is protective of human health and the environment. The fencing, deed restrictions and capping all provide protection from direct contact with contaminated materials. Capping of the landfill also reduces the percolation through the landfill and thus the migration of hazardous substances into groundwater and surface water. Monitoring of the groundwater and surface water will identify any failures of the containment system installed at the landfill. Once alerted to an elevated level of contaminants, additional corrective actions can be taken to abate any threat.

B. Attainment of Applicable or Relevant and Appropriate Requirements

The U.S. EPA's selection of site capping and related facilities for the Coshocton Landfill is intended to comply with applicable state solid waste landfill regulations.

The selected remedial alternative would also comply with specific public health and environmental requirements. These ARARs are called "chemical-specific" requirements. Public health and environmental ARARs expressed as chemical-specific limits or requirements would be addressed as follows:

- Routine monitoring of groundwater at the site to check for migration of releases into groundwater, surface water and gas.

If a need is indicated during design for these actions, the following actions may also be taken:

- Leachate/groundwater treatment at a local POTW;
- Routine monitoring of collected leachate/groundwater to determine loading to the POTW.

C. Cost-effectiveness

The selected remedy is prescribed by compliance with solid waste landfill closure ARARs. The range of alternative actions to meet closure requirements is very limited. Therefore, the chosen alternative is essentially cost-effective because it is the least expensive alternative which satisfies said regulations. Cost-effectiveness of the chosen alternative is established relative to alternatives AA-4 and AA-5 which would cost more without increasing the degree of compliance with ARARs.

The actual cost of implementing the remedial action is expected to be different than the order-of-magnitude cost estimate prepared in the feasibility study (FS). During design, some construction details may be developed to produce a closure system that will be lower in cost than the order-of-magnitude FS estimate. Conversely, factors may cause the cost to be higher than the estimate. The final implementation cost is expected to fall within the range of accuracy expected for the order-of-magnitude estimate developed.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

SARA mandates a preference for the selection of permanent remedies that completely or probably produce a "....permanent and significant decrease in the toxicity, mobility or volume of the hazardous substance, pollutant or contaminant."

SARA also specifies that the selected remedial action must use "... permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable". If the selected remedial action is not appropriate for the permanence and treatment preferences cited above, an explanation of why a remedial action not incorporating these features was selected is required.

A permanent remedy involving treatment or recovery technologies was not selected for the Coshocton Landfill. Permanent remedies using thermal oxidation treatment technologies were evaluated and were judged to be not practicable for the Coshocton Landfill site. Application of

treatment at the Coshocton Landfill would be impracticable for the following reasons:

- Hazardous substances were apparently placed haphazardly within the landfill waste mass during operation. Segregation of hazardous from non-hazardous waste would be impractical. Therefore treatment would be required for the entire waste mass. This was considered: 1) not technically practicable, 2) not prudent because of the potentially greater risk to human health and environment caused by excavation.

- The estimated cost of thermal treatment would be extremely high and require many years to complete.

- Full ARAR compliance would be achieved by landfill closure which would be protective of human health and cost effective.

OhioEPA

State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149

Toward A Cleaner Environment

Richard F. Celeste
Governor

June 8, 1988

Re: Coshocton Landfill
Coshocton County
Superfund Site

Mr. Valdas V. Adamkus
Regional Administrator
U.S. EPA, Region V
230 South Dearborn Street
Chicago Illinois 60604

Dear Mr. Adamkus:

After review of the draft Record of Decision (ROD) for the Coshocton Landfill site in Coshocton County, Ohio EPA concurs with the selected remedial alternative proposed for the site. The selected remedial alternative, titled the Chosen Alternatives in the ROD, is different from the preferred remedial alternative outlined in the Public Comment Feasibility Study Report dated February 3, 1988. The selected remedial alternative includes:

- Complete site fencing and posting;
- The recordation of notice in the chain of title regarding uses to which the property has been put, and any restrictions on its future uses;
- Site grading;
- Site capping which meets State solid waste landfill requirement;
- Site monitoring including groundwater monitoring, surface water monitoring, and landfill gas monitoring; and
- Top cover of topsoil and revegetation.

The following additional components of the selected alternative will be evaluated during the Remedial Design and may be included if necessary:

- Landfill gas collection and venting system;
- Leachate and groundwater collection and on-site storage system with facilities for truck loading; and
- Provisions for off-site treatment and disposal of collected leachate and groundwater at a local POTW.

The estimated present worth of the selected remedial alternative is $8.92 million. Estimated cost of operation and maintenance of the constructed remedy is $96,000 per year.

Sincerely,

Richard L. Shank

Richard L. Shank, Ph.D.
Director

RLS/RH/lz

cc: Maury Walsh, Deputy Director
Dave Strayer, CAS
Roger Hannahs, CAS
Scott Bergreen, SEDO

Final

Responsiveness Summary

Coshocton Landfill Site
Coshocton, Ohio
WA 82-5LC5.0

May 31, 1988
EPA Contract No. 68-01-7251

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Chapter 1
INTRODUCTION

The U.S. EPA has investigated the Coshocton Landfill site for the nature and extent of actual or threatened release of hazardous substances. Based on these investigations, the U.S. EPA has prepared an endangerment assessment and feasibility study to evaluate remedial actions and describe the preferred set of remedial actions for implementation. The preferred remedial actions were presented for public review and comment at a public meeting in Coshocton on February 23, 1988.

PURPOSE OF THE RESPONSIVENESS SUMMARY

Before the U.S. EPA makes the final decision to select and implement remedial actions, it must consider public comments and criticism. Public participation is required in Superfund projects according to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

This document summarizes the verbal and written public comments received on the feasibility study and preferred remedial actions. It describes the U.S. EPA's responses with explanation of how the comments were incorporated in the U.S. EPA's decisionmaking process.

BACKGROUND

The Feasibility Study (FS) for the Coshocton Landfill site was issued on February 3, 1988. The FS was based on site investigations conducted between 1983 and 1987. These investigations were conducted and reported in two phases: Phase I was done from 1983 to 1985 and reported in the Final Remedial Investigation Report on May 24, 1985; Phase II was done from 1985 to 1987 and reported in the Final Remedial Investigation Report Phase II on October 9, 1987.

The Endangerment Assessment (EA) for the site was prepared based on the Remedial Investigation reports. The EA was prepared by PRC Engineering and issued on January 4, 1988.

A public meeting on the FS was held on February 23, 1988 in the City of Coshocton. Written public comments were received by U.S. EPA through March 17, 1988.

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Chapter 2
FEASIBILITY STUDY OVERVIEW

The Feasibility Study summary below covers only the major features and issues addressed in the document which was issued on February 3, 1988. For a complete discussion of the issues and evaluations regarding remedial actions considered, the full report should be reviewed with the Endangerment Assessment (dated January 4, 1988) and the two Remedial Investigation reports (Phase I dated May 24, 1985, and Phase II dated October 9, 1987).

SITE BACKGROUND

The Coshocton Landfill is located on approximately 80 acres immediately south of State Highway 83 southeast of the City of Coshocton, Ohio. The site is a former coal strip mine. Between 1968 and 1979, the City conducted landfill operations at the site.

The wastes received at the Coshocton Landfill consisted of mixed municipal refuse and industrial wastes including solid scrap, drummed liquids, and free liquids. Through CERCLA 104 responses submitted in 1984, eight industries reported to U.S. EPA the waste quantities and types they disposed of at the landfill. In addition to relatively inert solid scrap wastes and nonhazardous materials, the liquid waste types included hazardous substances such as spent chlorinated solvents, nonchlorinated flammable solvents, resins, and plasticizers.

The physical site is characterized by considerable topographic relief. Much of the landfilled waste is situated in the void created by abandoned strip mine operations; i.e., between the mine face or "high wall" and the spoils pile set apart from the high wall. In addition to the mine filling, some waste was also reportedly placed in shallow excavations in the southern portions of the site.

Site geology generally consists of a series of related strata (Pennsylvanian Alleghany series) with the uppermost member being sandstone followed by coal (Middle Kittanning Coal or No. 6), clay, shale, coal, and clay. The nominal bottom of the Coshocton Landfill waste mass in the mine fill areas is at the bottom of the No. 6 coal.

Landfill operations were not well recorded. Although specific locations of waste materials are not clearly defined, three relatively distinct disposal areas have been described through conversation with local people, historical air photography, and geophysical data. These three areas are

termed the northern fill area, the "bad weather" fill area, and the southern fill area.

Currently, portions of the landfill site are covered with what appears to be mine spoil materials. The cover of the site is inconsistent; some areas have very little or no cover and standing water is common. Scattered surface deposits of drums and other metal objects are present. Numerous leachate seeps exist on the western and southern portions of the site.

The Coshocton Landfill site was ranked by the U.S. EPA on the National Priorities List (NPL) for further investigation and study under CERCLA. Investigation work by CH2M HILL and Warzyn Engineering at the site began in 1983 with preparation of a remedial action master plan.

Remedial investigation of the site began in late 1983 and continued through 1986 in two phases. The investigations developed information on site mapping, waste locations, hydrogeology, and chemical releases through groundwater, runoff, and leachate. These results are reported in detail in two separate remedial investigation reports.

ENDANGERMENT ASSESSMENT SUMMARY

An endangerment assessment was prepared for the Coshocton Landfill by PRC Engineering under a separate contract with U.S. EPA. This endangerment assessment was based on the site data developed during the remedial investigation.

A summary of conclusions from the endangerment assessment is presented below:

- Based on the data from the remedial investigation, the Coshocton Landfill site is releasing contaminants to the environment.

- Information reviewed by PRC identified a number of chemicals that were disposed of in the landfill during its operations. Results of analyses of site samples taken from leachate, groundwater, surface water, and sediment identified approximately 30 chemical constituents. However, PRC concluded that several contaminants reportedly disposed of in the landfill have not been identified in site samples.

- A number of contaminants disposed of in the landfill have not been identified in samples of the various media. The RI reports (CH2M HILL, 1985 and 1987) suggested four general hypothetical explanations. First, a fire that occurred in 1977 may have either oxidized the organics or caused

them to volatilize to the atmosphere. Second, the landfill may not have reached hydraulic saturation, but releases may begin in larger quantity after saturation is achieved. Third, releases may have occurred and are occurring but the contaminants have not yet reached the sampling points. Fourth, much of the hazardous liquid substances were placed in the landfill as drummed wastes and a majority of the drums have not yet started to leak.

- o PRC developed several exposure scenarios, identified populations potentially at risk, estimated the extent of exposures, and characterized risks from these exposures. The following exposure scenarios were developed:

  Human Population Exposures

  - Ingestion of contaminated groundwater
  - Ingestion of or direct contact with surface water
  - Direct contact with leachate
  - Ingestion of soil

  Aquatic and Animal Populations Exposures

  - Direct contact with surface water
  - Direct contact with sediments
  - Direct contact with leachate

- o Potentially significant noncarcinogenic and carcinogenic risks were identified based on four exposure scenarios:

  - Ingestion of groundwater
  - Ingestion of surface water
  - Ingestion of leachate
  - Ingestion of soil

  The risk estimates for each scenario were based on maximum concentrations observed in the RI and are very conservative, that is, very cautious estimates.

- o Concentrations of some constituents in the surface water and sediment were close to chronic concentration values of concern for aquatic life, but these chronic concentration values were not exceeded.

- Uncertainty exists regarding whether RI data represent the leading edge of a contaminant release episode or whether the observed releases represent a steady-state condition. If future releases increase, then potential risks to human health and environment will increase with time.

- It is not possible to predict whether contamination will migrate offsite or what receptor doses could be. The potential exists that releases will occur. Because of the uncertainty of the releases from the site, any future risk cannot be quantitatively or qualitatively evaluated except to note that the potential for risk exists.

PREFERRED REMEDIAL ACTION SUMMARY

At the conclusion of the feasibility study in January 1988, the U.S. EPA selected AA-4 as the preferred set of remedial actions for implementation at the Coshocton Landfill site. In summary, the overall selected remedial action would consist of the following features:

- Complete site fencing and posting

- Attachment of a note to the deed or title designating the site as a restricted use property, used to manage hazardous substances

- Site grading

- Site capping with a compacted clay and soil system to form a cap with lower permeability than the natural landfill base material

- Landfill gas collection and passive venting system

- Leachate and groundwater collection and onsite tank storage system with facilities for truck loading

- Provisions for offsite treatment of collected leachate and groundwater at a local POTW (the Coshocton POTW was used in this study for evaluation and cost estimation)

- Site monitoring including groundwater monitoring, collected leachate/groundwater monitoring, and landfill gas monitoring

This set of preferred remedial actions was termed Assembled Alternative No. 4 (AA-4) in the Feasibility Study. It was the proposed remedial alternative presented at the February 23, 1988 public meeting for comments.
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Chapter 3
PUBLIC COMMENTS--U.S. EPA RESPONSES

Public comments on the Feasibility Study report for the Coshocton Landfill were received by the U.S. EPA at a public meeting on February 23, 1988 and through written documents received by U.S. EPA at the Region V Chicago office until March 17, 1988. The list of all individuals who submitted public comments is given in Appendix A. The comments themselves are attached as Appendix B.

Several comments were directed at detailed legal interpretations of CERCLA/SARA and NCP requirements, particularly interpretation of the "applicable or relevant and appropriate requirements" or ARARs. This Responsiveness Summary addresses these legal comments in the last portion of this chapter. Responses to comments on law were prepared by U.S. EPA Regional Counsel.

Public comments on the Coshocton Landfill FS fell into the following major categories:

- Remedial Investigation (RI) reports and Feasibility Study (FS) report comments by the City
- Past waste disposal practices and landfill conditions
- Public health risks, both present and future
- Remedial action costs and local economic conditions
- Proposed alternative remedial actions
- Legal issues regarding ARARs and other provisions of CERCLA/SARA

Comments and U.S. EPA responses are organized below according to these categories.

COMMENTS ON RI AND FS REPORTS

The comments on the RI reports are contained in a document submitted by the potentially responsible parties (PRPs), "Comments Report for the Coshocton Landfill Superfund Site Coshocton, Ohio" dated March 16, 1988 and prepared by Dames and Moore (D&M Job No. 14211-002-17). Comments from this report are summarized and addressed below.

Comment. With regard to the results of the Phase I RI, the relatively predictable geologic conditions at the site, the lack of significant contamination identified during the

remedial investigation, and Dames and Moore's, routine site monitoring suggested that the site presented no threat to human health and the environment (Comments Report at 2).

U.S. EPA Response. U.S. EPA believed that the Phase I RI results were not conclusive. Phase I findings were not consistent with releases that could be reasonably expected given the reported past practices of bulk liquids disposal and drummed waste solvent disposal at the landfill. Phase II RI work was deemed warranted to increase confidence in the results. The U.S. EPA Endangerment Assessment conclusions agree with the general finding that releases observed from the site during the RI do not present a clear risk to human health and the environment.

Comment. Given the negligible present risk and speculative future risk, the remedy would not seem to meet any kind of test for cost-effectiveness (Comments Report at 3).

U.S. EPA Response. The EA concludes that future releases from the site are uncertain and future risks cannot be quantitatively or qualitatively evaluated except to note that the potential for risk exists. In the face of this uncertainty, the U.S. EPA selected a conservative position on stating the nature of the potential future risk caused by release of hazardous substances. The selection of the preferred remedial alternative was based on the application of landfill closure ARARs, particularly Ohio sanitary landfill closure requirements which were considered applicable. Proper landfill closure to restrict public access, minimize public contact and reduce infiltration while maintaining surface water and groundwater was deemed cost-effective.

Comment. In the absence of any significant present threat to human health and the environment, EPA appears to rely on the potential threat of future releases and their postulated impact on human health and the environment as a justification for requiring corrective action at the site (Comments Report at 4).

U.S. EPA Response. U.S. EPA considered the potential threat of future releases as one of the major factors in the selection of the preferred remedy. Other major factors were the fact that the amount and condition of hazardous substances remaining in the waste mass could not be quantified, future hazardous substance release rates and characteristics could not be quantified, future site development was unrestricted, infiltration and runoff was uncontrolled, and site monitoring was not established.

Under these circumstances, the U.S. EPA decided that closure of the site using a properly graded and compacted low-permeability cap with related site restrictions and monitoring

features was reasonable and consistent with applicable or relevant and appropriate environmental requirements.

Comments. The Comments Report prepared by Dames and Moore addressed each of the four hypotheses presented in the FS regarding why major releases of hazardous substances have not been identified during the RI (from Comment Report pages 4 and 5). These comments are summarized below:

1. The 1977 Fire. This hypothesis clearly has merit. Such a fire would have had the capacity to oxidize a substantial volume of organic waste. The fire reportedly covered a 5-acre area where drums were disposed of.

2. Landfill Hydraulics. It seems unlikely that the landfill has not reached an equilibrium condition with respect to hydraulic saturation. It is reasonable to assume that current leachate flow conditions are reasonably typical of those to be expected in the future from a hydraulic standpoint.

3. Leading Edge Hypothesis. Spoil bank wells must be representative of leachate chemistry. It is difficult to believe that contaminants would not have reached the sampling points in a 10- to 20-year period.

4. Drummed Waste Hypothesis. The 1977 fire is likely to have accounted for much of the liquid content of the landfill. The likelihood that large numbers of drums have maintained their integrity over this prolonged period is low. Conditions would not be expected to get significantly worse given a similar rate of deterioration of remaining drums in the future.

U.S. EPA Response. Each of these comments on the four hypotheses is addressed below.

1. The 1977 fire probably oxidized and volatilized some organic hazardous substances in a limited area of the landfill. The "capacity" of the fire in terms of the fraction of total organic waste affected is unknown. The fire reportedly covered about 5 acres, however, drums were disposed over a wide area of the landfill as evidence by drum appearances at the surface. Therefore, it is reasonable to assume that many drums of wastes were not affected by the fire.

2. The hydraulic equilibrium of the waste mass can be determined only by borings into the waste and in situ head measurements. Surface seepage observed on slopes following wet weather could be from channelled or perched infiltration flowing out of the slopes.

3. Leachate chemistry could change over time as drums or liquid pockets become available for release by waste shifting or drum deterioration. A "leading edge" could have been generated only recently.

4. The amount of organic hazardous substances "accounted for" in the 1977 fire is not known. The "likelihood" of drum integrity is speculation without evidence such as drum examination. Whether chemical release behavior or "conditions" will remain the same or get worse is unknown.

Comment. EPA's analysis of groundwater flow directions in the lower Kittanning Coal and Hamden Member appears to be suspect. The groundwater elevation in MWD-5 was ignored, whereas that in MW-21, a well which has clearly behaved erratically throughout the period of record, was included. The level in MW-21 appears unreasonably low. Revised interpretation would show a northwesterly groundwater flow towards North Creek and southerly and southeasterly flow into drainages tending in those directions. There is no evidence of southwesterly groundwater flow.

U.S. EPA Response. The groundwater gradient interpretation for the lower Kittanning Coal and Hamden Member in the Comments Reports is noted. The high groundwater deviation in MWD-5 was disregarded during RI data interpretation because of the possibility that the well seal had failed and water from the mine drift above was seeping through the seal. MWD-5 was not considered a reasonable recharge area as suggested by the suspect water elevations.

As noted in the Comments Report, the groundwater flow trend toward the south and southeast in the Hamden Member is in the direction of two private wells screened below the lower Kittanning Coal. Future property development and well construction in this area could increase the number of persons affected. Finally, the potential for fracture flow cannot be disregarded. As the RI noted, specific groundwater flow directions may not follow gradients exactly as in porous media flow because of fracture flow path.

Comment. Dames and Moore in the Comments Report concurs with the general conclusion of the endangerment assessment, that the present risk to human health and the environment appears to be negligible. The calculated levels of risk serve to demonstrate that remediation is difficult to justify on the basis of either current or realistic future risks to human health and the environment (Comments Report at 8).

U.S. EPA Response. Present calculated risks are low as discussed in the endangerment assessment. The endangerment assessment also noted that future risks could not be

evaluated quantitatively or qualitatively given uncertainty of future releases, but the potential for future risk exists.

The potential for future release and future risk from hazardous substances remaining onsite within the waste mass in combination with the need to comply with applicable or relevant and appropriate environmental regulations led to the U.S. EPA decision to prefer landfill closure as the remedial alternative. The types, conditions and amounts of hazardous substances remaining in the waste mass are unknown, but data from CERCLA 104 responses collected from PRPs in 1984 indicated that approximately 6.4 million pounds of hazardous substances were disposed of in the landfill. Therefore, the endangerment assessment concluded that future risk cannot be evaluated qualitatively or quantitatively--"realistic" future risks are very difficult to judge.

Comment. The Comments Report addressed each of the components of the U.S. EPA preferred remedial alternative. Each of these comments is summarized below.

1. Regrading. No specific comment was provided except to rephrase the work description from the FS.

2. Engineered Clay/Soil Cap. The estimated incremental cost of the incremental reduction of infiltration is 130 percent of the total cost estimated for regrading.

3. Leachate Collection/Treatment. The endangerment assessment suggests no significant risk caused by leachate discharge. Leachate collection capital cost is significant. O&M costs could be higher than estimated because pretreatment may be needed prior to POTW, likely reduction of iron and manganese rather than removal of synthetic organic compounds.

4. Gas Collection. There is no evidence of gas production at the site. Sealing of the landfill is likely to cause more of the fill material to change from aerobic to anaerobic conditions. A low permeability cap may increase gas pressure. The proposed gas collection system appears to be excessively elaborate. Sampling discrete gas vents would seem more appropriate.

5. Revegetation. The Comments Report concurred that this is the standard means of stabilizing landfill covers.

6. Fencing. Fencing will effectively limit access to contaminated soil and leachate. These risks are then reduced to zero.

7. Site Restrictions. Legal restrictions are another effective way of eliminating exposure pathways and reducing associated risks to zero.

8. Monitoring. It is reasonable to ensure that a properly designed monitoring program will allow time for response to any deterioration in conditions before they become threatening to human health.

U.S. EPA Response. Each of these comments on the preferred remedial alternative components is addressed below.

1. Regrading. This would be a part of any landfill capping configuration because existing site grades are not acceptable.

2. Engineered clay/soil cap. The incremental cost for infiltration reduction is high. The engineered clay/soil cap is an Ohio sanitary landfill closure requirement. The "clay" portion of the cap must be a "well compacted cover material" according to state regulations and can be loam, silty loam, sandy loam, clay loam, silty clay, or sandy clay. The FS used the term clay and unit costs representative of suitable material.

   In response to public comments including those of the PRPs, the configuration for the engineered clay/soil cap was modified within the specific requirements for Ohio solid waste landfill closure. These changes to the preferred remedial alternative are generally as follows:

   - Delete the sand drainage layer and drainage piping (Defer to final design decision).
   - Plan to use low permeability compacted cover material as both a portion of the fill and for the finished cap.

   These changes reflected a more economical conceptual design while still conforming to Ohio solid waste landfill closure requirements.

3. Leachate collection/treatment. Leachate collection was included in the preferred alternative in the FS as a conservative measure to be in place if future releases developed. Capital cost of installing a leachate collection system as part of a low permeability cap may be lower than as a later retrofit. O&M is difficult to estimate and could be higher than assumed in the FS because of pretreatment requirements. The expressed concern over possible pretreatment for iron and manganese is unsupported.

In response to public comments including those of the PRPs, the decisions as to whether to construct leachate and groundwater collection and treatment facilities were deferred to final design. Leachate and groundwater collection may be required to comply with Ohio solid waste landfill closure requirements or as a possible contingency response in the event of a future release.

4. Gas collection. The RI did not look for methane gas. Gas probes were not installed to seek landfill gas at the site. There is no direct evidence of gas production; however, landfill gas (mostly carbon dioxide and methane) is a typical feature of municipal landfills that have received garbage.

   Conversion from aerobic to anaerobic conditions is not expected. Rather, the assumption is that anaerobic conditions prevail now assuming this is a typical municipal/industrial landfill. A well compacted cap would tend to trap landfill gas that may otherwise escape through the surface.

   In response to public comments including those of the PRPs, the decision as to whether to construct the landfill gas collection and passive venting system was deferred to final design. In the event that gas collection and venting is incorporated in final design, a more simple gas venting arrangement then shown in the FS may be acceptable. Boring into the landfill waste mass to install gas collection wells was not considered acceptable in the FS. This was the reason why the FS alternatives were based on a network of surface gas collectors installed in porous media immediately under the low permeability cap.

5. Revegetation. Revegetation is an important part of any site grading or capping work. Revegetation increases release of water by transpiration and controls erosion through soil anchoring in root structure.

6. Fencing. Fencing would reduce ease of public access to the site and thereby reduce direct contact risks. Fencing cannot completely prevent determined persons from entering the site, so direct contact risks cannot be assumed to be reduced to "zero."

7. Site Restrictions. Legal restrictions are a means of preventing future uncontrolled site development. However, legal restrictions can be changed over time and effectiveness can be decreased, therefore, potential risks associated with future site development cannot be assumed to be reduced to "zero."

8. Monitoring. A well designed monitoring program would serve to verify the effectiveness of remedial actions and trigger additional actions as needed. The time for response in the event of a detected release would probably be sufficient for protection of human health and the environment.

Comment. Given the previous history of the situation, the entire episode is beginning to reek of "self-justification" on the part of the EPA officials both federal and state. It almost seems as if the agencies feel they are in a face-saving situation and that something has to be done to make previous expenditures seem justified. To ask the community to spend $17.5 million on an unproven problem borders on abuse of regulatory power. (Mr. Bruce W. Wallace's comment.)

U.S. EPA Response. Previous expenditures on the remedial investigations and feasibility study were required by law and the NCP and were, therefore, already justified. The selection of the preferred remedial actions was based on the need to comply with all applicable or relevant and appropriate environmental laws and regulations. The preferred alternative would meet requirements for landfill closure which was deemed an applicable requirement since the landfill was never closed in accordance with State regulations.

Comment. The FS report uses words like "could," "possibly" and "potentially"--these terms show guessing and hedging on inconclusive work rather than standing up and saying "yes" or "no." (Mr. Howard S. Beall's comment.)

U.S. EPA Response. The U.S. EPA often must use these kinds of words to describe judgments on current conditions subject to uncertainty and future situations or conditions that may or may not occur. In all hazardous waste projects, information is limited and complex problems require that statements use qualified terms. These terms express accurately the uncertain nature of the situation and acknowledge the probabilistic basis for conclusions and assumptions.

PAST LANDFILL PRACTICE AND CONDITIONS

Comment. I am 100 percent behind the EPA spending whatever it takes to make that old landfill safe. I am not in favor of leaving this problem in the hands of the City of Coshocton. The landfill has caused us hardships. . . the fires, explosions, smoke, flies, gup (sic) running free, dead animals, garbage on top of the ground--rats and dog packs which ultimately menaced neighboring farms and residences. (Mrs. Robert L. Jacobs' comment.)

U.S. EPA Response. With regards to the remedial action work being in the hands of the City of Coshocton, the U.S. EPA may

enter into a written agreement with the City for the City to do the work which would be enforceable as an order as specified by U.S. EPA. Often this kind of agreement can expedite work. The City's work would be supervised by U.S. EPA and, if it were deemed deficient or unduly delayed, then U.S. EPA would take action, either on its own or by asking the court for relief. The "hardships" reported due to the landfill are noted.

PUBLIC HEALTH RISKS

Comment. We want our water supplies tested in this area and some consideration for our health and property for a change. (Mr. James V. Cognion's comment.)

U.S. EPA Responses. U.S. EPA found very low concentrations of organic solvent releases in the groundwater wells nearest to the buried waste mass and no evidence of release in wells further away. Contamination of current private wells near the landfill is not expected. The U.S. EPA will evaluate the need for private well sampling during the remedial design.

REMEDIAL ACTION COSTS AND ECONOMIC EFFECTS

Comment. The estimated $17.5 million for the selected preferred site remedy would cause undue economic stress on the community. (Comment by Coshocton County Commissioners, Coshocton Area Chamber of Commerce, and many others.)

U.S. EPA Response. It is not the intention of U.S. EPA to place the community in economic hardship by the selection of remedial actions at the site. The cost of the remedial actions must be reasonable in terms of current future risk reduction. Serious consideration has been given and will continue to be given to cost reduction and control in the implementation of any remedial action at the site.

PROPOSED ALTERNATIVE ACTIONS

Comment. City officials have taken every step to comply with EPA directives and the site is now being monitored with no evidence of hazard to our citizens. (Comment by Mr. John L. West/Stone Container Corporation and many others.)

U.S. EPA Response. The City has monitored the landfill site in compliance with an agreement between the City and U.S. EPA. However, the older records of the landfill indicate that the landfill was never closed in accordance with Ohio EPA sanitary landfill closure regulations after landfill operations ceased in 1979.

Comment. Reconsideration of the plan is urged. Give closer study to past actions and the monitoring plan submitted by the City and PRPs. (Comment by Coshocton County Commissioners, Coshocton Area Chamber of Commerce, and many others.)

U.S. EPA Response. U.S. EPA, on the basis of public comments, additional information regarding the types of wastes, clarification of Ohio regulations, and an alternative proposal submitted by PRPs for remedial actions has reconsidered the selected remedy. The alternative remedial proposal submitted by the PRPs on March 16, 1988 called for more site work than monitoring alone. The PRPs proposed plan called for site fencing, regrading to achieve minimum and maximum slopes, surface revegetation with topsoil cover to promote growth, establishment of site restrictions, long-term monitoring of leachate surface water and groundwater, and a commitment to take further remedial actions in the event that monitoring shows the need for further actions.

Comment. There is no simple solution for this landfill's problems and there will be a definite impact on our lives no matter what is decided. There is differing opinion on present danger but all seem to agree as to the potential for future release from the site. It is time to get a good well drained cover on the site and let it rest. (Mr. Donald Wells' comment.)

U.S. EPA Response. The goal of U.S. EPA's decisions is to minimize the effect of the landfill on the health and welfare of local citizens and the environment. The present danger or risk posed by the landfill appears minor, however, U.S. EPA is concerned that future releases could occur and cause threats to human health or environment. The position of the PRPs has been that there is little potential for future release. A properly constructed cover or site cap would be a major improvement over existing site conditions because it would reduce infiltration of water and practically eliminate probability of casual contact with surface wastes.

LEGAL ISSUES REGARDING ARARs AND OTHER PROVISIONS OF CERCLA/SARA

[The following comments were prepared by U.S. EPA Regional Counsel for incorporation into this Responsiveness Summary.]

A group of the PRPs submitted a 22-page comment over the signature of Paul J. Lambert, legal counsel to General Electric (letter dated March 16, 1988).* A significant portion of the

*Stone Container submitted a comment, on its own, which restates the issues raised in the Lambert letter. This response is meant to respond to the Stone Container comment as well.

comment is devoted to legal argument, particularly of the "applicable or relevant and appropriate" concept embodied in CERCLA Section 121. The legal issues addressed by the comment have not yet benefitted from a direct, dispositive court interpretation, as evidenced by the dearth of authority cited in the comment. Moreover, a significant number of these issues are the subject of evolving EPA policy as it gains experience in the implementation of the 1986 Amendments to the law and as courts render decisions on the meaning of specific provisions. Thus, this response is necessarily a function of the above factors, is limited solely to the Coshocton Landfill site, and does not represent a general Agency position or policy. Moreover, should litigation ensue, the Agency reserves its right to amend the views expressed hereafter.

The following are the summary comments of the PRPs set forth in pages 2 to 3 of their letter and the Agency's responses to each.

Comment. "A. As a matter of law, no remedy can be justified under CERCLA in the absence of a substantial danger to present or future public health or welfare or the environment. See CERCLA § 104 and definition of remedy in CERCLA § 101(24). The Endangerment Assessment of this site does not support a finding of such an endangerment."

U.S. EPA Response. This comment is, in essence, a statutory construction argument. Though it is undeniable that words such as "substantial" and "significant" are subject to interpretation, and though parts of CERCLA are arguably ambiguous, it is the Agency's position that fundamental rules of statutory construction support its choice of remedy in this matter. The present context is not appropriate for a full briefing of the position contrary to that offered by the PRPs. However, there exists an ample factual basis in the administrative record for U.S. EPA's choice of remedy, and the following nonexclusive list of commonly articulated rules of construction support the Agency's disagreement with the PRP comment.

1. Inasmuch as CERCLA is a remedial statute, courts are to liberally interpret any ambiguous language so as to effectuate the statutory purpose. United States v. Mottolo 605 F. Supp. 898, 902 (D.N.H. 1985).

2. The same liberal construction is required because CERCLA was enacted for the "protection and preservation of public health." United States v. Conservation Chemical Co. 619 F. Supp 162, 192 (D.C. Mo. 1985).

3. An administrative agency's regulatory interpretation of ambiguous provisions, as well its practices, are entitled to substantial deference, particularly where the subject matter is of a technical or scientific nature. See Artesian Water Co. v. Gov. of New Costle County 659 F. Supp. 1269, 1290-91 (D. Del. 1987) and cases cited therein. U.S. EPA has promulgated regulations at 40 C.F.R. § 300.68 which set forth procedures and standards to guide the selection of a remedy at an NPL site. The remedy chosen at the conclusion of that process is entitled to a strong presumption that it is consistent with CERCLA. U.S. v. Northeastern Pharm. and Chem. Co. 579 F. Supp. 823, 850-51 (W.D. Mo. 1984).

In summary, the Agency believes there is a more than sufficient factual and legal basis to conclude that remedial action is necessary at the Coshocton Landfill site. Notwithstanding the PRPs' reservation of their aforesaid argument, they have offered to perform an alternative remedy.

Comment. "B. Without prejudice to foregoing argument, the City and local industry support the remedial action described in detail in Section IV below and in the Dames and Moore report entitled "PRP's Proposed Alternative Plan for the Coshocton Landfill Superfund Site." This remedial plan is substantially the same as "Assembled Alternative No. 3" as described in the FS and contemplates, in addition, a commitment to take further action in the event that predetermined groundwater, surface water, and leachate standards are exceeded. This alternative remedy would be protective of human health and the environment and cost effective as required by CERCLA § 121(b)(1) and it would attain a degree of control that assures protection of health and the environment as required by CERCLA § 121(d)."

U.S. EPA Response. U.S. EPA's position is that with further specificity and with certain revisions so as to make the PRP alternative equivalent to the state solid waste closure requirements, and with a readily enforceable mechanism to compel necessary, future remedial action, it is possible that the PRPs' proposal could be determined to be sufficient to protect the public health and the environment. The PRPs' proposal suggests a remedy which is less costly, initially, but which could be substantially more expensive should the monitoring system detect changed conditions. Generally, it is EPA's preference to undertake a comprehensive containment action early on, so as to minimize the chance that further remedial actions may be required in the future. The PRPs, on the other hand, have expressed a preference for a less comprehensive (and less costly) initial containment action, with the understanding that should said initial action not be sufficient, the ensuing remedy could be more costly. While it may not be appropriate for the federal government

to "gamble" in this way, if financially viable private entities agree to undertake the remedy and are willing to enter into an enforceable court order by which they would be obligated to quickly act in response to changed conditions, the government may be willing to consider a remedy by which the PRPs explicitly assume such a risk.

Comment. "C. The EPA Preferred Remedy is not required or justified by the ARARs identified in the FS. Those ARARs are action-specific in nature and both CERCLA § 121 and EPA's Interim Guidance on ARARs make clear that such ARARs may not dictate a remedy that is not otherwise required to conform to statutory mandates. In addition, the identified ARARs are neither applicable nor relevant and appropriate to this site."

U.S. EPA Response. Much of the PRP argument in support of the summary comment, above, is consistent with the EPA's general position. However, it reflects a misunderstanding of the process leading to the chosen remedy in this matter.

The PRP comment assumes that but for ARARs, no remedy at all would have been proposed for this facility. To the contrary, the historical evidence of the substances disposed in the landfill, coupled with the evidence of releases (albeit in relatively low concentrations) mandated a remedy. The Agency rejected remedies involving treatment, destruction, and excavation/removal in favor of a containment approach. Once a remedy was selected which depended upon utilizing methodologies to prevent the hazardous substances from migrating, action-specific ARARs became appropos.

As discussed in the Record of Decision (ROD), the Agency has been persuaded that neither the state nor the federal hazardous waste regulations are "appropriate" to this site, though they are certainly "relevant." However, contrary to the PRP position, the Agency continues to believe that state solid waste regulations are "applicable," for the reasons set forth in the ROD. Moreover, the federal RCRA Subtitle D "Guidelines" regarding solid waste landfill closures are "relevant and appropriate."

The PRP discussion which contends that the state regulations defining solid wastes makes those regulations inapplicable to CERCLA substances and the argument based on the "more stringent" phrase are inventive, but not persuasive to the Agency. The Agency believes that Congress intended that cleanup activities conform to state laws which are implicated by remedial actions. For example, remedial actions occurring in wetlands must presumably comply with state wetland regulations. Similarly, remedial actions occurring on solid waste landfills must, at a minimum, comply with state solid waste standards.

However, even if the PRP's argument regarding state solid waste regulations were accepted, the RCRA Subtitle D guidelines, which set forth virtually the same capping specifications, are appropriate.

In summary, then, EPA agrees that neither the state nor the federal standards regarding hazardous wastes are "applicable" or "appropriate," but it deems standards regarding the closure of solid waste facilities to be "applicable" and "appropriate" to this site.

Comment. "D. To the extent that the Preferred Remedy is required by ARARs, compliance with them is excused pursuant to the exceptions stated in CERCLA § 121(d)(4)(D) because the alternative remedy proposed by the City and local industry will achieve an equivalent standard of control and will be fully protective of public health and environment."

U.S. EPA Response. The PRPs assert that their proposed alternative remedy would provide equivalent protection to that which the Agency has under consideration. As acknowledged in the ROD and above, there may be an alternative approach which, if embodied in an enforceable court order requiring viable parties to take further actions specified by EPA, could be sufficiently protective. However, until such time as an alternative methodology is specified in detail and made a part of an enforceable order, any equivalency discussion is speculative. As noted, the PRP proposed alternative of March 16, 1988, absent certain revisions and enforceability mechanisms, cannot be deemed to be equivalent.

The PRPs have requested that the Agency exercise its "waiver" authority pursuant to CERCLA § 121(d)(4)(D), on the basis that their alternate proposal will attain an equivalent standard of performance. As noted, such an action would be premature, and it is not clear that a modified alternate proposal in the nature of that proposed by the PRPs might not meet "applicable" or "appropriate" state and federal standards. Until the waiver issue is ripe for determination, the Agency defers its response on the availability of the proffered waiver authority.

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Appendix A (Page 1 of 7)
LIST OF INDIVIDUALS
WHO COMMENTED ON THE COSHOCTON LANDFILL FS

	Company or Individual Name	Representative	Date
1.	The Beach Co. 240 Brown's Lane Coshocton, OH 43812-0538 614/622-0905	James W. Beach President	Undated
2.	Farley & Sons, Inc. 51 Pine Street Coshocton, OH 43812	Shirley F. Farley	Undated
3.	John P. Hamlmayer* DDS	---	Undated
4.	Thomson McKinnon Securities, Inc. 124 Chestnut Coshocton, OH 43812 614/623-0315	Dorothy S. Cutzs Financial Consultant	03/03/88
5.	Coshocton Brake & Supply Co. Box 665 Coshocton, OH 43812 614/622-0595	James M. Baylor Manager	03/02/88
6.	Banner Fibreboard Co. 47849 Papermill Road Coshocton, OH 43812	James H. Shanklin Resident Manager	03/04/88
7.	A. Altman Co. (AAC) 1201 Bldg. 30th St. NW Canton, OH 44709 614/492-4202	Robert Altman	03/03/88
8.	Carns-Lowe Insurance Agency Inc. 119 South Sixth Street Coshocton, OH 43812 614/622-0733	Terry L. Lowe	Undated
9.	Colonial Flag Co. P.O. Box 507 Coshocton, OH 43812 614/622-4447	Vane S. Scott General Manager	Undated
10.	Esther F. Matis 19074 T.R. 450 Coshocton, OH 43812	---	02/24/88
11.	Coshocton Towne Centre Realty	Judith E. Whitaker Broker	Undated
12.	Buckeye Fabric Finishing Co. Coshocton, OH 43812 614/622-3251	Kevin E. Lee President	03/04/88
13.	BryCo P.O. Box870 Coshocton, OH 43812 614/623-0830	Paul E. Bryant Owner	03/09/88
14.	Wise Jewelers, Inc. 419 Main Street Coshocton, OH 43812 614/622-0478	Greg Fisher Manager	03/04/88

* = Handwritten Signature. Spelling is uncertain.

	Company or Individual Name	Representative	Date
15.	BryDet Development Corp. P.O. Box 870 Coshocton, OH 43812 614/622-0478	Ronald C. Deeter Vice President	03/09/88
16.	Main Office Supply Sprint Print 504 Main Street Coshocton, OH 43812 614/622-7115	Joy Ann Padgett* Owner	Undated
17.	Ohio AMCO Inc. P.O. Box 207 Coshocton, OH 43812 614/623-0660	Paul E. Bryant President	03/09/88
18.	Shannon Temporary Services Inc. 415 Walnut Street Coshocton, OH 43812 614/622-2600	Edward A. Seitz President	03/04/88
19.	Shaw-Barton Inc. 545 Walnut Street Coshocton, OH 43812 614/622-4422	Charles E. Fetterolf President, CEO	03/07/88
20.	Roes Fashions of Coshocton 423 Main Street Coshocton, OH 43812	Tom and Carol Matteson* Owners	Undated
21.	Coshocton Area Chamber of Commerce 124 Chestnut Street Coshocton, OH 43812 614/622-5411	Pat Brown Executive Director	03/01/88
22.	Mutual Federal Savings & Loan Assoc. 100 Downtowner Plaza Coshocton, OH 43812	Roger L. Bennett Vice President	03/03/88
23.	Three Rivers Dental Arts 304 Chestnut Street Coshocton, OH 43812 614/622-9557	Randy L. Kreuter DDS	Undated
24.	Edward E. Montgomery Roscoe Village Coshocton, OH 43812	---	03/05/88
25.	SanCast Inc. 535 Clow Lane Coshocton, OH 43812 614/622-8660	R.P. Geyer President	03/03/88
26.	Robert D. Mauch Certified Public Accountant 305 Main Street Coshocton, OH 43812 614/622-8101	---	03/03/88
27.	Beutenmiller Local & Long Distance Moving P.O. Box 339 Coshocton, OH 43812 614/622-6114	Paul R. Wiggins* Secretary-Treasurer	Undated

* = Handwritten Signature. Spelling is uncertain.

	Company or Individual Name	Representative	Date
28.	Edwin F. Mulligan Box 386 Coshocton, OH 43801	---	03/08/88
29.	BancOhio National Bank 413 Main Street Coshocton, OH 43812 614/622-2211	Ben E. Roadruck, Jr.*	03/02/88
30.	BancOhio 413 Main Street Coshocton, OH 43812 614/622-2211	Gary E. Atkinson*	Undated
31.	BancOhio National Bank 413 Main Street Coshocton, OH 43812 614/622-2211	Jean M. Baker*	Undated
32.	BancOhio National Bank 413 Main Street Coshocton, OH 43812 614/622-2211	Melvin Contrell*	Undated
33.	BancOhio National Bank 413 Main Street Coshocton, OH 43812 614/622-2211	Richard L. Richissin Area President	03/02/88
34.	Pretty Products 437 Cambridge Road Coshocton, OH 43812 614/622-3522	Gene Border Manager of Personnel	03/03/88
35.	Pretty Products 437 Cambridge Road Coshocton, OH 43812 614/622-3522	Daniel L. Penrod Vice President Treasurer	03/07/88
36.	Ohio House of Representatives 95th House District Coshocton, Guernsey & Holmes Counties P.O. Box 367 Senecaville, OH 43780 District: 614/685-2877 Columbus: 614/466-6935	Joe Secrest Chairman Ohio House Energy and Environment Committee	03/15/88
37.	Coshocton County Memory Gardens 25580 St. Rt. No. 621 Coshocton, OH 43812 614/622-7157	Carla E. Zinkon District Office Manager	Undated
38.	Rea & Associates Inc. P.O. Box 607 Coshocton, OH 43812 614/622-8783	Gene E. Flowers CPA	03/03/88
39.	Rea & Associates Inc. P.O. Box 607 Coshocton, OH 43812 614/622-8783	David M. Cain CPA	03/0/388

* = Handwritten Signature. Spelling is uncertain.

	Company or Individual Name	Representative	Date
40.	Rea & Associates Inc. P.O. Box 607 Coshocton, OH 43812 614/622-8783	D.J. Muse CPA	03/03/88
41.	Dr. J.J. McConnell*	---	Undated
42.	Coshocton County Convention and Visitors Bureau P.O. Box 905 Coshocton, OH 43812 614/622-9314/800/338-4724	Harold F. Turner Secretary	03/07/88
43.	Kenneth and Kaye Noble 19519 C.R. 7 Coshocton, OH 43812 614/622-0847	---	03/05/88
44.	United States House of Representatives 18th District, Ohio 2183 Rayburn House Office Bldg. Washington, DC 20515 202/225-6265	Douglas Applegate Member of Congress John Glenn United States Senator	03/17/88
45.	United States House of Representatives 18th District, Ohio 2183 Rayburn House Office Bldg. Washington, DC 20515 202/225-6265	Douglas Applegate Member of Congress John Glenn United States Senator	03/17/88
46.	McDonald's of Tuscarawas & Coshocton Counties 1200 West High Avenue New Philadelphia, OH 4663__ 216/339-6416	Dana J. Lewis* Owner/Operator	Undated
47.	Shriver Tire Service 123 Mulberry Street Coshocton, OH 43812 614/622-6746	Charles E. Shriver	Undated
48.	Robert F. McCoy 2216 Forest Hill Drive Coshocton, OH 43812	---	03/08/88
49.	Scheeff Chevrolet Third & Walnut P.O. Box 637 Coshocton, OH 43812 614/622-0626	Gary E. Scheeff President	Undated
50.	Carroll's Buckeye Motors 1102 Chestnut Street P.O. Box 278 Coshocton, OH 43812 614/622-8350	James L. Carroll	03/11/88
51.	Robert P. Glazier*	---	Undated
52.	Harold E. Hunt Attorney at Law 448 Chestnut Street Coshocton, OH 43812	---	03/09/88

* = Handwritten Signature. Spelling is uncertain.

	Company or Individual Name	Representative	Date
53.	Coshocton City Schools 1207 Cambridge Road Coshocton, OH 43812 614/622-1901	John Berg PhD Superintendent	03/03/88
54.	Bordenkircher Electric, Inc. P.O. Box 776 Coshocton, OH 43812 614/622-5557	Walter Bordenkircher Secretary/Treasurer	Undated
55.	Wagner's Supply, Inc. South Second Street Coshocton, OH 43812 614/622-5711	Gordon R. Wagner General Manager	03/08/88
56.	Jacobs Insurance Service, Inc. 530 Main Street P.O. Box 367 Coshocton, OH 43812 614/622-1796	Roy J. Snyder	03/08/88
57.	Fern Woodie* 1149 Stewart Lane Coshocton, OH 43812	---	03/08/88
58.	Stone Container Corporation 500 North Fourth Street Coshocton, OH 43812 614/622-6543	John L. West	03/02/88
59.	Stone Container Corporation and Coshocton Mill	John L. West General Manager Coshocton Mill	03/17/88
60.	Bingham, Dana & Gould 1724 Massachusetts Ave. NW Suite 400 Washington, DC 20036 202/822-9320	Paul J. Lambert	03/15/88
61.	Bingham, Dana & Gould 1724 Massachusetts Ave. NW Suite 400 Washington, DC 20036 202/822-9320	Paul J. Lambert	03/15/88
62.	Bingham, Dana & Gould 1724 Massachusetts Ave. NW Suite 400 Washington, DC 20036 202/822-9320	Paul J. Lambert	03/16/88
63.	General Electric Company 1350 South Second Street Coshocton, OH 43812 614-622/5310	Richard F. Anderson Project Engineer	08/28/80
64.	Coshocton County Commissioners 349 1/2 Main Street Coshocton, OH 43812 614/622-1753	Harold F. Turner James R. Ross John E. Porteus	03/07/88

* = Handwritten Signature. Spelling is uncertain.

	Company or Individual Name	Representative	Date
65.	Ross Bros., Inc. Box 46 Adams Mill, OH 43801	Edward R. Ross*	Undated
66.	Howard S. Beall 1020 Cambridge Road Coshocton, OH 43812-2703	---	03/11/88
67.	James V. Cognion* 19487 CR 7 614/622-3952	---	03/08/88
68.	Pearldene Schaeffer* 45660 CR 58 Coshocton, OH 43812	---	03/08/88
69.	Marilyn's Natural Foods 430 Main Street Coshocton, OH 43812	Marilyn J. Share	03/15/88
70.	Russ Mossman*	---	Undated
71.	Marilyn J. Wiley 1685 South 14th Street Coshocton, OH 43812	---	03/15/88
72.	Coshocton Broadcasting Co. 745 South Sixth Street Coshocton, OH 43812 614/622-1770	Bruce Wallace President	03/13/88
73.	Mrs. Robert L. Jacobs 19020 TR 450 Coshocton, OH 43812	---	03/14/88
74.	Donald G. Wells*	---	Undated
75.	Kahoun Kabinets Kitchen Bath Center 316 West Main West Lafayette, OH 43845	Elaine L. Kahoun* Manager	Undated
76.	Coshocton Lumber Company, Inc. 1200 Walnut Coshocton, OH 43812 614/622-0199	Chris Weily* President	Undated
77.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Victor A. Reidenbach*	03/09/88
78.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Melva R. Hawthorne*	03/09/88
79.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Elizabeth M. Green*	03/09/88

* = Handwritten Signature. Spelling is uncertain.

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	Company or Individual Name	Representative	Date
80.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Margaret A. Prindle*	03/09/88
81.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Joseph P. Sapp*	03/09/88
82.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Janice C. O'Bryon*	03/09/88
83.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Marilyn A. Lauvray*	03/09/88
84.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Vernon J. Saybar*	03/09/88
85.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Mrs. A. Abbot*	03/09/88
86.	Lawrence Insurance Agency 147 South 2nd Street P.O. Box 577 Coshocton, OH 43812	Robyn K. Abbot*	03/09/88

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* = Handwritten Signature. Spelling is uncertain.

(iii) procedures and techniques for compacting and covering waste materials; and

(iv) methods, if any, used for control of odors, noise, litter and leachate; and

(v) weights and types of equipment used to operate site or facility; and

(vi) types of wastes received, and approximate weekly quantity of each type; and

(c) a description of how the facility will be closed.

(K) (1) the operator of each solid waste disposal facility which was *not* subject to Chapter 3745-26 of the Regulations of the Ohio EPA shall submit the report as described in paragraph (J) above, and may submit applications for waivers under Regulation 3725-27-11, in accordance with the following schedule:

County	*Deadline for Operational Report Submission*
Cuyahoga	January 1, 1978
Lucas	
Franklin	
Butler	April 1, 1978
Columbian	
Hamilton	
Lake	
Lorain	
Mahoning	
Montgomery	July 1, 1978
Stark	
Summit	
Trumbull	
[illegible]n	October 1, 1978
Ashtabula	
Clark	
Crawford	
Erie	
Fairfield	
Fulton	
Geauga	
Hancock	
Licking	January 1, 1979
Marion	
Medina	
Miami	April 1, 1979
Muskingum	
Portage	
Richland	
Sandusky	
Tuscarawas	
Wayne	
Wood	
All Other Counties	July 1, 1979

(2) For facilities subject to paragraph (1) above which were established on or after July 1, 1968, the Director may require the operator to submit detail plans, specifications, and information in accordance with Regulation 3745-27-6 in addition to the oper report. The Director shall impose this requiremen the [illegible] such factors as the location, geol hydrology of the site; the characteristics of the materials received; or the operation of the facil determines that there exists a substantial threat o pollution or a potential health hazard. The operati submit such detail plans, specifications, and infor within one hundred eighty days after being noti this requirement.

(3) If detail plans, specifications, and informat disapproved, and all remedies for such disapprov been exhausted or waived by failure to timely pursu [illegible] remedies, the operator shall cease receipt of waste materials not later than 60 days after such disapproval becomes effective.

3745-27-10 *CLOSURE OF SANITARY LANDFILLS*

(A) Closure of a sanitary landfill shall be deemed to occur if:

(1) the operator declares the facility closed; or

(2) a solid waste disposal license held by the sanitary landfill expires, and no further license has been applied for in the manner prescribed in Chapter EP-33; and

(3) a solid waste disposal license held by the sanitary landfill has expired, a further license has been applied for and denied, and all remedies for such denial have either been exhausted, or waived by timely failure to pursue such remedies; or

(4) a solid waste disposal license held by the sanitary landfill has been suspended or revoked, and all remedies for such revocation or suspension have either been exhausted or waived by timely failure to pursue such remedies; or

(5) detail plans, specifications and information submitted as required by Regulation 3745-27-09 (K)(2) are disapproved, and all remedies for such disapproval have either been exhausted or waived by failure to timely pursue such remedies.

(B) (1) If closure will occur as described in paragraph (A)(1) or (2) above, notice of intent to close the sanitary landfill shall be provided to the Board of Health, or, if the Director has assumed the licensing function pursuant to Ohio Revised Code Section 3734.08, to the Director, not less than 60 days prior to closure.

(2) Upon receiving the notice referred to in paragraph (1) above, or upon occurrence of the events described in paragraph (A)(3) or (4) above, the Board of Health, or, if the Director has assumed the licensing function pursuant

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to Ohio Revised Code Section 3734.08, the Director, shall at least once a week for not less than four weeks, publish prominent notice of the closure in a newspaper of general circulation in the county in which the sanitary landfill is located. Such notice shall be similarly published in any other county which has been the source of 25 percent or more of the solid waste disposed of at the site that has been closed. This paragraph shall not apply to disposal facilities receiving only wastes generated on the premises where the facility is located.

(C) Not later than 60 days after closure of a sanitary landfill, the operator shall complete the following actions:

(1) All waste materials deposited in the sanitary landfill shall be covered with at least two feet of well compacted cover material that meets the requirements set forth in Regulation 3745-27-09(F); and

(2) The site shall be seeded with such grasses or other vegetation as will grow to form a complete and dense cover, which seeding shall be done as many times as necessary to insure compliance with this requirement; and

(3) All land surfaces shall be graded to slopes of no less than 1 percent and no greater than 25 percent; and

(4) All land shall be graded and drainage facilities shall be provided so as to direct surface water off the site, and not allow ponding of water on the site; and

(5) Ventilation structures shall be installed and maintained as necessary to control gas migration; and

(6) The site shall be baited for rodents, and treated for other vectors if necessary; and

(7) Except for facilities receiving only wastes generated on the premises where the facility is located, signs stating in letters not less than three inches high that the facility is permanently closed shall be posted in such a manner as to [illegible] site, which signs shall be maintained in legible condition for not less than two years after closure of the site; and

(8) A plat of the site shall be filed with the Board of Health having jurisdiction, the County Recorder of the county in which the facility is located, and the Director, which plat shall accurately locate and describe the completed site and include information relating to the area, depth, volume, and nature of the waste materials deposited in the sanitary landfill; and

(9) Except for facilities receiving only wastes generated on the premises where the facility is located, all entrances and access roads to the facility shall be blocked by locked gates, fencing, or other sturdy obstacles to prevent unauthorized access, unless the site is to be used for other than solid waste disposal.

(D) The Health Commissioner and the Director or his authorized representative, upon proper identification, may enter any closed sanitary landfill at any reasonable time for the purpose of determining compliance with this Regulation, 3745-27-10.

(E) If, within three years after closure, settling occurs to such an extent that ponding of water occurs on those portions of the site where waste materials are deposited, the operator, owner, or lessee shall promptly re-grade the site and/or add additional cover material and re-seed as necessary to eliminate the ponding.

(F) If, within three years after closure, cracking or erosion of the cover material occurs to such an extent that water may enter the cells, the operator, owner, or lessee shall promptly re-grade the site/or add additional cover material, and re-seed as necessary to eliminate the cracking and erosion.

(G) All monitor wells required by this Chapter, 3745-27, shall be maintained by the operator, owner, or lessee in such condition that water samples may be obtained for a period of three years after closure.

(H) If, within the three year monitoring period required by paragraph (G) above, leachate is detected on the site, or is draining from the site, in such quantities that the Director or his authorized representative or the Health Commission believes that a substantial threat of water pollution exists,

(1)(a) leachate shall be contained on the site and properly treated, or

(b) leachate shall be collected and transported from the site and properly treated, and

(2) action shall be taken to control, minimize, or eliminate the conditions which contribute to the production of leachate, and

(3) monitor wells shall be maintained by the owner, operator, or lessee in such condition that water samples may be obtained.

Actions required by this paragraph shall be continued until the Director or his authorized representative or the Health Commissioner is satisfied that actual or potential pollution of ground or surface water has been effectively controlled, minimized, or eliminated.

3745-27-11 *WAIVERS*

(A) If both the Health Commissioner and the Director or his authorized representative determine that a natural disaster or other catastrophic occurrence justifies temporary noncompliance with Regulation 3745-20-05(C), they may grant an oral waiver thereof. Requests for such waivers shall be justified in writing by the applicant within fifteen days after the granting thereof. Waivers shall be confirmed in writing by the Health Com-

missioner and the Director as soon as practicable, and in no case more than 30 days after the waiver is granted.

(B) Any person who wishes to obtain a waiver of any provision of Regulation 3745-27-6(I), 3745-27-07, 3745-27-08, 3745-27-09, except 3745-27-09(C), or 3745-27-10 shall apply in writing to the Director. Applications for waivers shall contain such detailed information regarding the objectives, procedures, controls, and any other pertinent data regarding the proposal, as the Director may require. An incomplete application shall not be considered. Within 30 days of the date of receipt of an incomplete application, the applicant shall be notified of the nature of any deficiency and of the Director's refusal to consider the application until the deficiency is rectified and the application completed.

(C) Any solid waste disposal facility in operation on [effective date of these regulations] which *was* subject to Chapter HE-24 of the Regulations of the Ohio EPA shall comply fully with all applicable provisions of Regulations 3745.27-07, 3745-27-08, 3745-27-09 until any waiver granted by the Director becomes final, unless the site or facility is excused from full compliance by the terms and conditions of a conditional operating license.

(D) Unless the Director has assumed the solid waste disposal licensing function pursuant to Ohio Revised Code Section 3734.08, he shall, when considering any request for a waiver, consult with the Board of Health prior to issuing a proposal or final action to grant or deny the waiver.

(E) In granting any waiver, the Director shall state with precision the provision or provisions of the regulations a waiver of which is being granted, and shall also state with precision any terms or conditions imposed upon the applicant in place of compliance with the provision or provisions a waiver of which is being granted, and may also, where appropriate, specify the time period for which the waiver is being granted.

(F) the Director shall grant a waiver only if the applicant demonstrates to the Director's satisfaction that construction and/or operation of the solid waste disposal facility in the manner allowed by the waiver and any terms or conditions imposed as part of said waiver will not cause water pollution, will not create a nuisance or a health hazard, and will not result in a violation of any regulation adopted by the Director pursuant to ORC Chapter 3704.

(G) The Director shall issue a proposed or final action to grant or deny any requested waiver within 90 days of the date on which a complete application for a waiver is received, in accordance with Chapter 3745-47 of the Regulations of the Ohio EPA.

(H) For purposes of appeal of the Director's actions under ORC Chapter 3745 or Chapter 3745-47, "waiver" shall be equivalent to "variance."

(I) Operators of solid waste disposal facilities which were *not* subject to Chapter 3745-26 [repealed] of the Regulations of the Ohio EPA may submit applications for waivers under this Regulation, 3745-27-11 in accordance with the schedule set forth in Regulation 3745-27-09(k)(1).

3745-37-01 *SOLID WASTE DISPOSAL LICENSE REQUIRED*

(A) No person shall operate a solid waste disposal facility unless such person holds a valid and unexpired solid waste disposal license for such facility issued by the Board of Health of the Health District wherein the facility is located, or by the Director, if the Director has assumed the licensing function pursuant to Ohio Revised Code Section 3734.08, unless the facility is subject to Regulation 3745-37-02(D)(1), in which case such person shall apply for the initial license for the facility in accordance therewith.

(B) A copy of the license shall be posted in a prominent location at the facility and shall be subject to inspection by any person during normal operating hours.

3745-37-02 *SOLID WASTE DISPOSAL LICENSE APPLICATION*

(A) Applications for solid waste disposal licenses required by Regulation 3745-37-01 shall be made on forms prepared by the Director and shall contain such information as the Director may require. An incomplete application shall not be considered. Within 30 days of the receipt of an incomplete application, the applicant shall be notified of the nature of the deficiency and of the Director's or the Board of Health's refusal to consider the application until the deficiency is rectified and the application completed.

(B) Applications for solid waste disposal licenses shall be signed

(1) in the case of political subdivisions, by the chief administrative officer or contractual officer of said subdivision; or

(2) in the case of corporations, by the corporate officer having direct responsibility for the facility; or

(3) in the case of organizations other than corporations by an equivalently responsible individual; or

(4) in all other cases, by the operator.

(C) The signatures shall constitute an agreement that the signers shall assume responsibility for substantial compliance with Ohio Revised Code Chapter 3734 and these Chapters, 3745-27 and 3745-33.

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(D) (1) (a) Facilities subject to Regulation 3745-27-09(K) shall apply for the initial solid waste disposal license within thirty days of submitting the operational report.

(b) All subsequent solid waste disposal licenses for facilities subject to this paragraph shall be applied for in the manner set forth in paragraph (D)(2) below.

(2) Except as provided in paragraph (1) above, applications for solid waste disposal licenses shall be made

(a) prior to start-up, and

(b) during the month of September, if the facility will continue operations beyond December 31.

Any license application not filed in the manner set forth in this Regulation, 3745-37-02(D), shall not be considered.

3745-37-03 *CRITERIA FOR ISSUING SOLID WASTE DISPOSAL LICENSES*

The Board of Health or the Director, whichever is applicable, shall not issue a solid waste disposal license unless

(A) a permit to install, if required by Chapter EP-30 of the Regulations of the Ohio EPA, has been obtained by the applicant; and

(B) detail plans have been approved by the Director, if required by Ohio Revised Code Section 3734.05, or by Regulation 3745-27-06 unless plan review and approval is pending under Regulation 3745-27-09(K)(2); and

(C) in the case of a previously or currently operating site or facility, the applicant operated the facility in substantial compliance with all applicable provisions of ORC Chapter 3734 and with these Chapters, 3745-27 and 3745-37, or Chapter 3745-26 [repealed], during the period of effectiveness of the last license held for the facility; and

(D) in the case of new facilities, the facility is adequately prepared for operations, and has been inspected by the Health Commissioner and by the Director or his authorized representative; and

(E) the person identified as the operator of the facility is competent and qualified to operate the facility in substantial accordance with ORC Chap. 3734 and these Chapters, 3745-27 and 3745-37.

3745-37-04 *ACTION BY BOARD OF HEALTH OR DIRECTOR*

(A) The Board of Health or the Director shall either grant or deny a solid waste disposal license within 90 days of the date upon which a complete application is received, unless detail plans required by Regulation 3745-27-06 have not been approved and permits required by Chapter 3745-37 of the Regulations of the Ohio EPA have not been issued by the Director prior to expiration of this 90 day period, in which case a license shall be issued or denied not later than 30 days after the effective date of the Director's approval of such detail plans and issuance of such permits.

(B) All licenses applied for pursuant to Regulation 3745-37-02(D)(2)(b) shall contain an effective date of January 1. Licenses applied for pursuant to Regulation 3745-37-02 (D)(1) or (D)(2)(a) shall be effective upon the date of issuance.

3745-37-05 *EXPIRATION OF LICENSES*

All solid waste disposal licenses shall expire on December 31 of the year in which they become effective, unless the license is for a facility subject to Regulation 3745-27-09(K)(3), in which case the license shall expire on the date set forth herein.

3745-37-06 *TRANSFER OF LICENSES*

(A) A person holding a solid waste disposal license shall not transfer said license to another person unless the license holder notifies the Board of Health and the Director in writing of the identity of the transferee and of the transferee's assumption of his obligations, at least 60 days prior to the effective date of the transfer.

(B) Not later than 60 days after receiving such notice, the Board of Health or the Director may disapprove the transfer, if the Board or the Director concludes, based on the transferee's previous operations, that the transferee will not operate the facility in substantial compliance with Ohio Revised Code Chapter 3734 and these Chapters, 3745-27 and 3745-37, or that the facility cannot be brought into substantial compliance. The Board of Health or the Director shall promptly notify the transferee and the transferor of his or its decision in writing and shall state the reasons for his or its conclusions.

(C) A solid waste disposal license may not be transferred from one facility to another.

3745-37-07 *PROCEDURES FOR GRANTING, DENYING, SUSPENDING, MODIFYING, REVOKING, OR DISAPPROVING TRANSFER OF SOLID WASTE DISPOSAL LICENSES.*

(A) In granting, denying, suspending, modifying, revoking, or disapproving transfer of solid waste disposal licenses, the Director shall act in accordance with the provisions of Ohio Revised Code Chapters 119 and 3745, and Chapter 3745-47 of the Regulations of the Ohio EPA.

(B) In granting, denying, suspending, modifying, revoking, or disapproving transfer of solid waste disposal

licenses, the Board of Health shall act in accordance with ORC Sections 3734.09, 3709.20, and 3709.21, and ORC Chap. 119.

3745-37-08 *APPROVED LIST OF HEALTH DISTRICTS*

(A) The Director shall survey annually each Health District [illegible] required by Ohio Revised Code Section 3734.08, to determine whether there is substantial compliance with ORC Chapter 3734 and with these Chapters, 3745-27 and 3745-37. Substantial compliance shall be deemed to exist if:

(1) Applications for solid waste disposal licenses are on file for each licensed solid waste disposal facility in the Health district, and

(2) Applications are properly completed with all required information, and

(3) All known solid waste disposal facilities operating in the Health district and required to hold licenses by this Chapter 3745-27, and ORC Sec. 3734.05 do hold valid and unexpired licenses, and.

(4) No license has been issued for any new solid waste disposal facility prior to the Director's issuance of required permits and approval of required detail plans, and

(5) Certification of inspection and compliance has been made to the Director within thirty days after issuance of a solid waste disposal license, as required by ORC Sec. 3734.07, and

(6) The Board of Health inspects solid waste disposal facilities subject to these Chapters, 3745-27 and 3745-37, with sufficient frequency to insure substantial compliance therewith, and in any event inspects each such solid waste disposal facility at least quarterly, and inspects each such new solid waste disposal facility at least bi-weekly during the first three months of operation, and

(7) The Board of Health maintains a file of information relating to each licensed solid waste disposal facility, and to each sanitary landfill closed within the last five years, which file shall include applications for solid waste disposal licenses, certification records, inspection records, approved plans, litigation information (except that privileged by the attorney-client relationship), and other pertinent information, and

(8) The Board of Health undertakes appropriate actions against persons holding solid waste disposal licenses and against persons who operate solid waste disposal facilities without holding required solid waste disposal licenses, and against other persons, whenever necessary to bring about substantial compliance with ORC Chap. 3734 and these Chapters, 3745-27 and 3745-37, and

(9) The Board of Health takes immediate action to abate serious hazards to the public health resulting from violations of ORC Chap: 3734 and these Chapters, 3745-27 and 3745-37, and

(10) The Board of Health complies with Regulation 3745-37-07, and

(11) The Board of Health seeks legal assistance from appropriate state and local agencies as necessary to carry out its assigned responsibilities.

(B) If the Director determines that there is substantial compliance with ORC Chap. 3734 and with these chapters, 3745-27 and 3745-37, he shall place the Health District upon the approved list.

(C) If the Director determines that there is not substantial compliance with ORC Chap. 3734 and with these Chapters, 3745-27 and 3745-37, he shall promptly notify the Board of Health of his determination by certified mail. The Director or his authorized representative shall also consult with and advise the Board of Health regarding its ineligibility to be placed on the approved list and steps to be taken to bring the solid waste program into compliance.

(D) Between one hundred twenty and one hundred eighty days after the mailing of the notice required by paragraph (C) above, the Director shall re-survey the Health District. If he determines that there is substantial compliance, he shall place the Health District on the approved list. If he determines that there is still not substantial compliance with ORC Chapter 3734 and these Chapters 3745-27 and 3745-37, he shall promptly

(1) enter such determination into his journal, and

(2) notify the Board of Health of his determination by certified mail, and

(3) publish notice of his determination in the Ohio EPA *Weekly Review*, and

(4) publish notice of his determination in a newspaper of general circulation in the area within the jurisdiction of the board of Health.

(E) Within fifteen days after receipt of the notice specified by Regulation 3745-37-08(D)(2) above, the Board of Health shall comply with the requirements of ORC Sec. 3734.08

3745-37-09 *RETURN OF SOLID WASTE DISPOSAL LICENSING FUNCTION TO BOARDS OF HEALTH*

(A) The Director shall return the solid waste disposal licensing function to a Board of Health from which he has taken the licensing function pursuant to Ohio Revised Code Section 3734.08 and Regulation 3745-37-08 if he determines that the Board of Health is both capable of and willing to enforce all applicable requirements of ORC Chapter 3734 and these Chapters, 3745-27 and 3745-37.

(2) In making the determination required in paragraph (A) above, the Director shall take into consideration

(1)(a) changes in or additions to the staff, and

(b) increases in the funds available to the Board of Health for enforcement of ORC Chap. 3734 and these Chapters, 3745-27 and 3745-37; and

(2) written assurances from the Board of Health of increased efforts on the part of the Board, and

(3) decreases in the number of complexity of the solid waste disposal facilities that would be within the Board of Health's jurisdiction, and

(4) any other factor that indicates to the Director that the board of Health meets the criteria set forth in paragraph (A) above.

(C) If the Director makes the determination described in paragraph (A) above, he shall promptly

(1) enter such determination into his journal, and

(2) notify the Board of Health of his determination by certified mail, and

(3) publish notice of his determination in the Ohio EPA *Weekly Review*, and

(4) publish notice of his determination in a newspaper of general circulation in the area within the jurisdiction of the Board of Health

3745-37-10 *TIME FOR INSPECTIONS*

Whenever a person requests in writing that the Health Commissioner or the Director or his authorized representative make any inspection required by these Chapters, 3745-27 and 3745-37, the Health Commissioner of the Director or his authorized representative shall make such inspection within 15 calendar days of receipt of the request.

3745-37-11 *CONDITIONAL SOLID WASTE DISPOSAL LICENSES*

(A) Before the Board of Health or the Director may make final the suspension, denial, or revocation of any solid waste disposal license held by any political subdivision, the Board or the Director shall issue a proposed suspension, denial, or revocation in the manner set forth in Regulation 3745-37-07.

(B) If the political subdivision to which the proposed suspension, denial, or revocation is issued requests an adjudication hearing to contest the proposed denial, suspension, or revocation, the political subdivision may, at the adjudication hearing, present evidence relating to its financial ability to comply with Chapter 3745-27. such evidence shall show

(1) that the political subdivision is levying taxes that revenues from which may be expended to comply with Chapter 3745-27 at the maximum rates imposed by the Ohio Constitution and the applicable statutes, and

(2) that the political subdivision has diligently attempted to increase taxes the revenues from which may be expended to comply with Chapter 3745-27 beyond the limits normally imposed by the applicable statutes and the Ohio Constitution and has been unsuccessful, and

(3) that expending sufficient funds to comply with Chapter 3745-27 would divert revenues from police forces, courts, fire departments, or general public health programs other than solid waste disposal, and

(4) that incurring indebtedness for purposes of compliance with Chapter 3745-27 would be imprudent in view of the overall financial condition of the political subdivision, or that, if indebtedness has already been incurred, incurring additional indebtedness would be imprudent, and

(5) that the political subdivision cannot legally levy and enforce a user fee on all users of the site or facility sufficient to permit compliance with Regulation 3745-27, and

(6) that the political subdivision cannot feasibly utilize the licensed disposal facility of another political subdivision, or operate a disposal facility jointly with another political subdivision, and

(7) that the political subdivision has fully assessed the capabilities and capacities of private solid waste management firms to supply those facilities and/or services for which the application for a conditional solid waste disposal license is being made. The Board or the Director shall require evidence that the political subdivision has directly contacted private firms and has been unable to secure those services or facilities for which the conditional license is being requested.

(C) If the political subdivision proves to the satisfaction of the Board or the Director that all of the criteria set forth in paragraph (B) above are satisfied, the Board or the Director may, if the hearing was from denial of a license, grant a conditional operating license, which shall grant the political subdivision from compliance with such provisions of Chapter 3745-27 as were shown at the hearing to be beyond the political subdivision's financial ability; or may, if the hearing was from suspension or revocation of a license, modify the license so as to excuse the political subdivision from compliance with such provisions of Chapter 3745-27 as were shown at the hearing to be beyond its financial ability. Such licenses shall be in all other respects identical to other solid waste disposal licenses issued under this Chapter, 3745-37.

(D) Whenever the Board or the Director grants a conditional solid waste disposal license as provided in paragraph (D) above, it shall specify in the license a reasonable time within which the political subdivision shall be required to bring the solid waste disposal facility for which the license was issued into full compliance with Chapter 3745-27.

(I) Whenever a political subdivision holding a conditional operating license, or a solid waste disposal license modified pursuant to paragraph (D) above, is required by Regulation 3745-37-02(D) to apply for another license because of the impending expiration of the currently effective license, such political subdivision shall make application in the same manner as applications are made for other solid waste disposal licenses. The Board of Health or the Director shall process such application in the same manner as other applications are required to be processed by this Chapter, 3745-37. If, upon receiving notice of the Board's or the Director's proposed denial of the application, the political subdivision determines that it wishes to obtain another conditional operating license, it shall proceed as provided in paragraphs (B) through (E) above.

(F) No solid waste disposal facility operating under a conditional license shall be permitted to receive sewage solids, semi-solids and liquids, other semi-solids or liquids, or hazardous wastes.

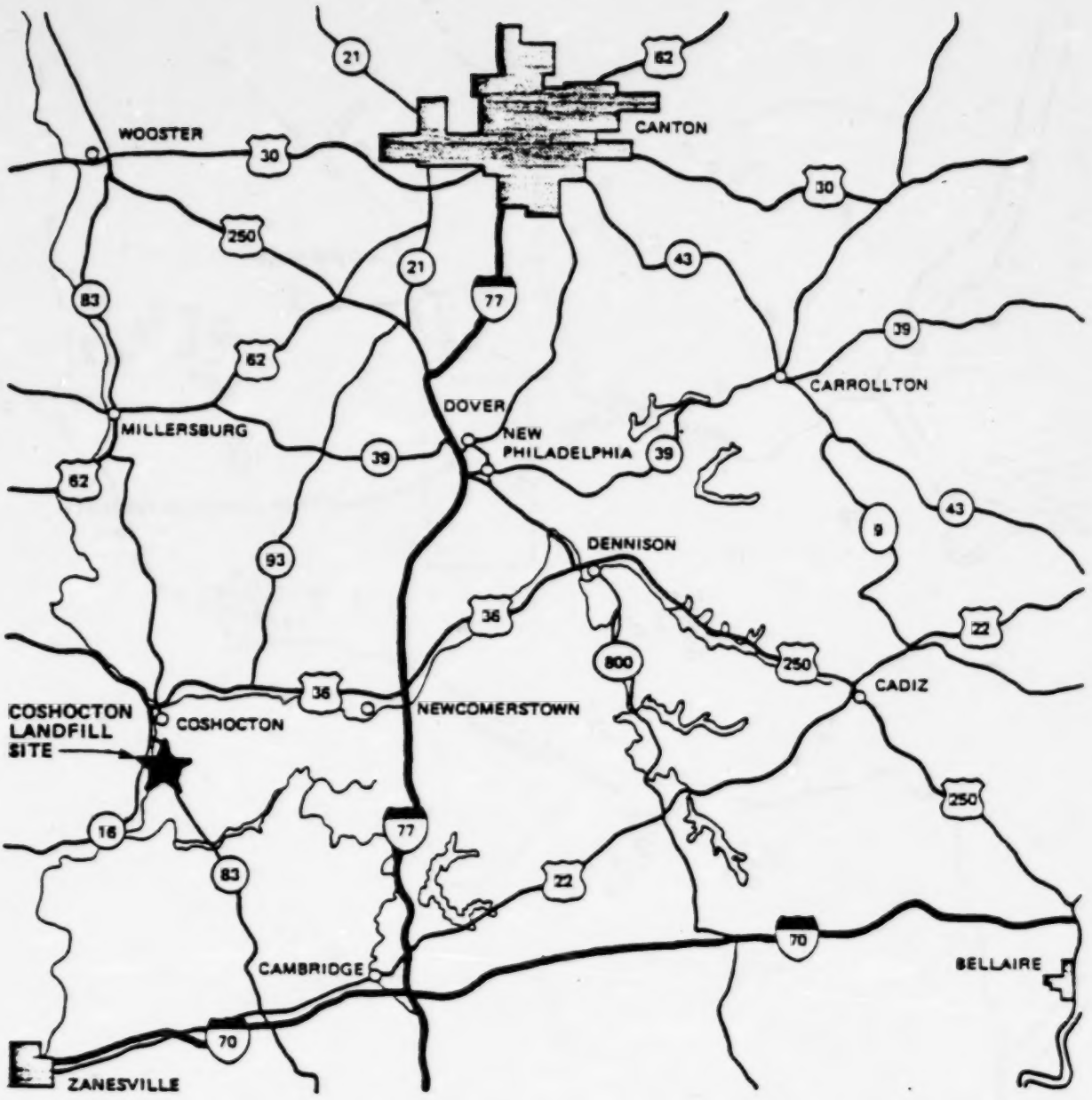
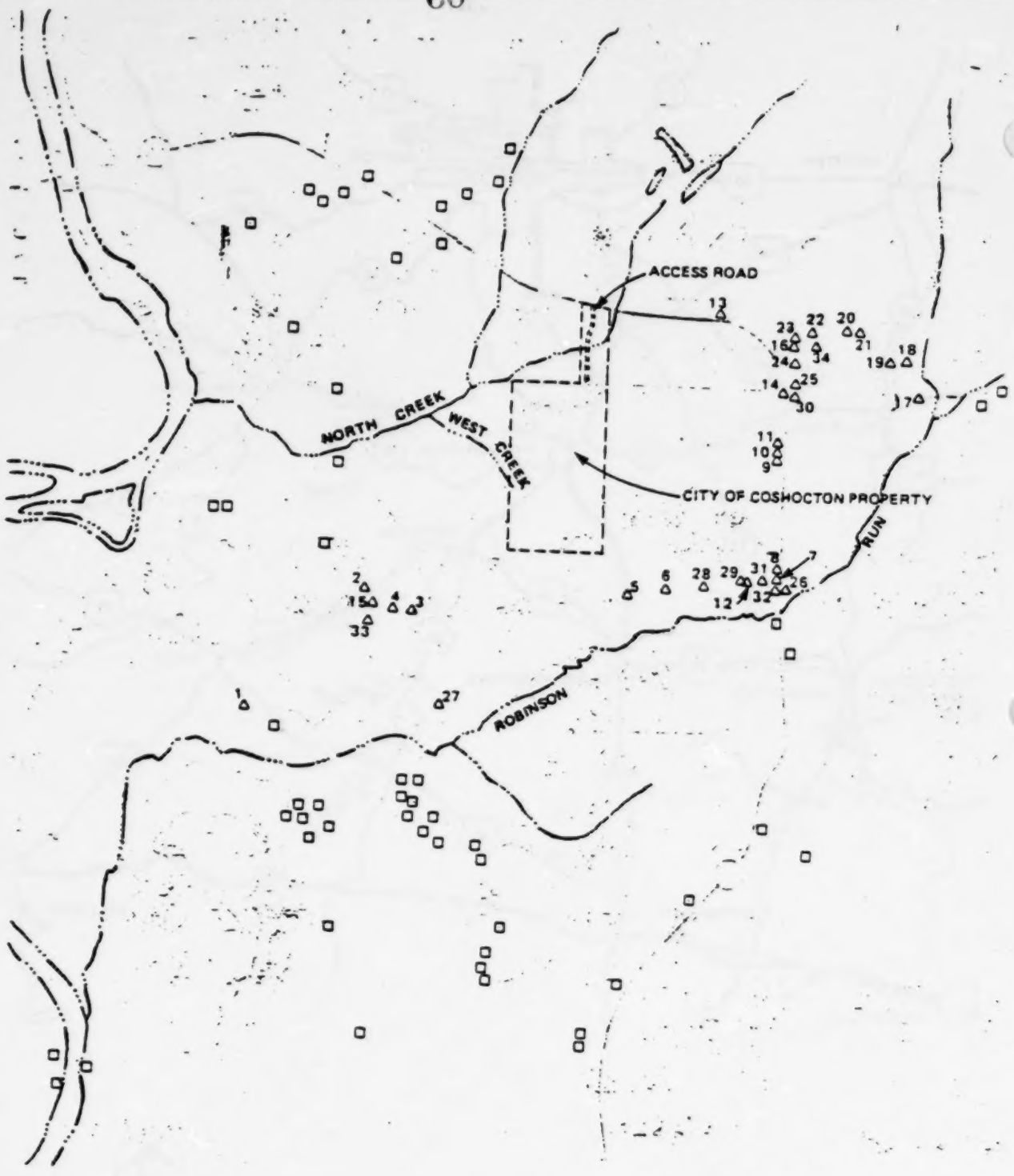


FIGURE 1-1
SITE VICINITY MAP
COSHOCTON FS



LEGEND

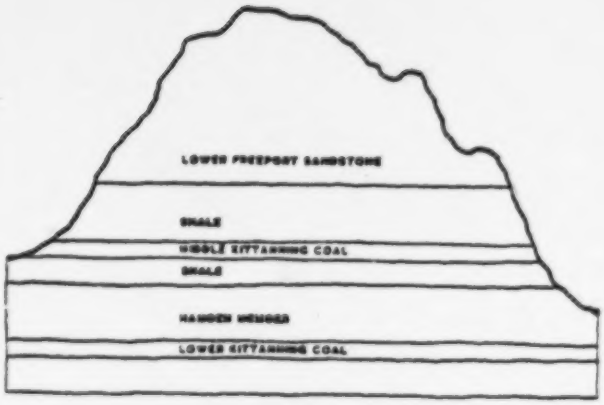
△ PRIVATE WELL LOCATION AND NUMBER

□ ADDITIONAL HOMES (NO PRIVATE WELL DATA CURRENTLY AVAILABLE)

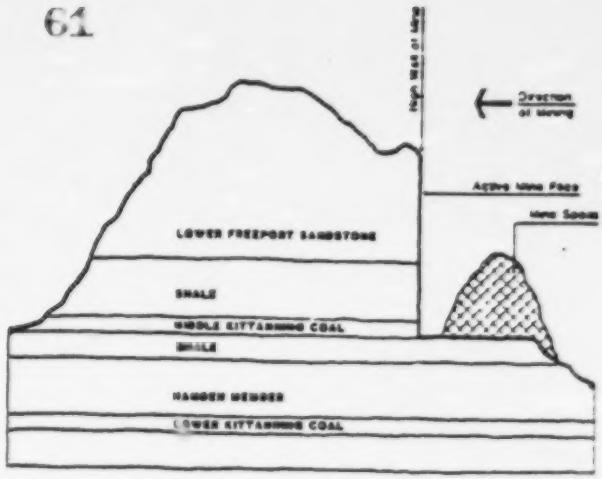
NOTE: Private well locations obtained from Permit 1006, Hydrology Map Cravat Coal Co.

* Additional home locations from Willis Creek U.S.G.S. Topographic Map

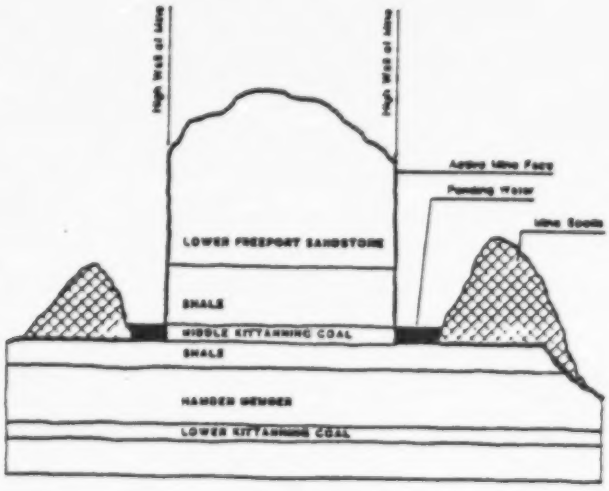
FIGURE 1-3
SITE LOCATION
COSHOCTON LANDFILL



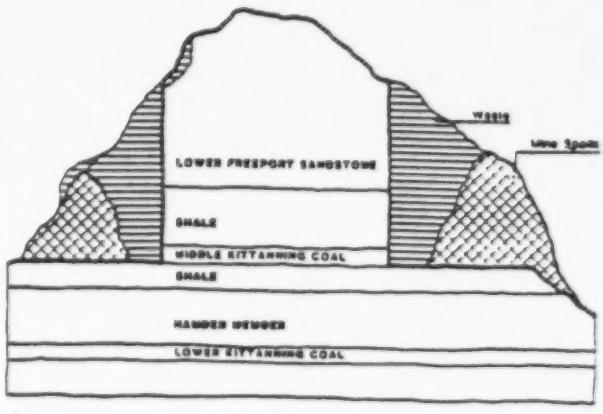
PREMINING CROSS SECTION (1)
NOT TO SCALE



ACTIVE MINING CROSS SECTION (2)
NOT TO SCALE

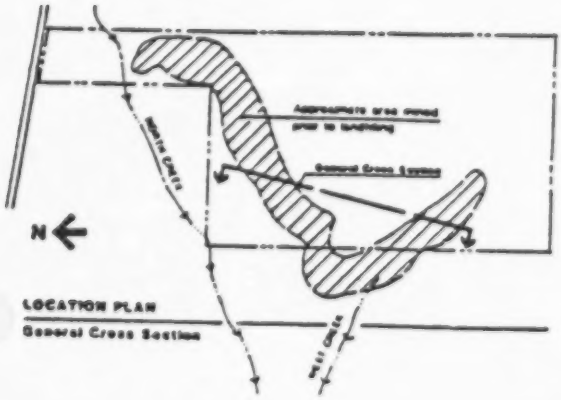


POST MINING CROSS SECTION (3)
NOT TO SCALE



POST LANDFILLING CROSS SECTION (4)
NOT TO SCALE

NOTE: These sections are general in nature and are not intended to provide detailed representation of geologic conditions. These sections should be used only to obtain a general knowledge of mining and/or filling activities.



LOCATION PLAN
General Cross Section

FIGURE 1-5
COSHOCTON SITE MINING AND LANDFILLING GENERAL CROSS SECTIONS
COSHOCTON .NDF 1.1

Table 3-2 (Page 1 of 6)
APPLICABLE TECHNOLOGIES AND PROCESS OPTIONS FOR THE COSHOCTON LANDFILL WASTE MASS

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
No Action	NONE Leave site as it is.	Yes	The NCP requires No Action to be carried through to detailed analysis of alternatives.
Access Restrictions	DEED RESTRICTIONS All deeds for property within potentially contaminated areas would include restrictions on use of property.	Yes	Potentially feasible.
	SITE FENCING Fencing around the site and drainage ditches. All fencing would be maintained as necessary.	Yes	Potentially feasible.
	MONITORING Collect and analyze groundwater, surface water, and sediment runoff to detect changes in quality.	Yes	Potentially feasible.
Containment	SURFACE CONTROLS Grading. Reshape surface contours to manage surface water.	Yes	Potentially feasible.
	Revegetation. Establish vegetative cover to stabilize surface soils.	Yes	Potentially feasible.
	Dust Control. Prevent excess dust conditions by the use of water spray or chemical agents.	No	Existing vegetative cover provides adequate dust control.
	Soil Cover. Cover site with soil and establish vegetative cover to reduce potential for direct contact, erosion, volatilization or dust generation.	Yes	Potentially feasible.
	CAP Single Layer. Cover contaminated landfill contents with a single layer of low permeability material such as clay, asphalt, or concrete.	Yes	Potentially feasible. However, effectiveness is severely limited because of probable cracks and fractures caused by weathering, wet site conditions and settlement of landfill contents.

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Containment (Cont'd)	Multilayer. Combine several layers of cover materials such as soil, synthetic membrane, and clay to provide erosion and moisture control in addition to containing the landfill contents. May require preloading landfill to control settlement problems.	Yes	Potentially feasible.
	VERTICAL BARRIERS Use of slurry walls, grout curtains, sheetpiles or vibrating beam methods to prevent horizontal contaminant migration.	No	Very limited application because landfill waste mass is located almost entirely above the water table. Vertical barriers may possibly be used to block downgradient contaminant migration in the lower shale and Hamden member. Vertical barrier would cause groundwater mounding to fill without groundwater/leachate collection system.
	HORIZONTAL BARRIERS Use of block displacement or injection grouting to prevent downward migration of contaminants into saturated zone.	No	Not applicable because of difficulty in determining the integrity of the barrier.
	SOLIDIFICATION/STABILIZATION Injection Grouting. Stabilization of contaminated landfill contents by injecting grout into the ground through well points.	No	Difficult to determine integrity of barrier.
	Cementation. Contaminated fill excavated, mixed with cement or lime, water, and silicious material to physically stabilize the waste and replace onsite or dispose of at a RCRA landfill.	No	Not feasible for landfill contents because large amount of organic wastes not amenable to cementation process.
	Organic Polymer Solidification. Contaminated landfill contents excavated, mixed with an organic polymer and replaced onsite.	No	Not practical with heterogenous waste type.
Removal	EXCAVATE Mechanical Excavation. Employ construction equipment such as a backhoe, dragline crane, or scraper and front end loader, to dig up contaminated landfill contents.	Yes	Potentially feasible. May require limited dewatering of the lower fraction of landfill waste mass below the water table.

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Disposal	ONSITE DISPOSAL		
	RCRA Type Landfill. Permanent storage facility onsite, double lined with clay and a synthetic membrane liner and containing a leachate collection/detection system.	Yes	Potentially feasible.
	Vault. Disposal of landfill contents in a concrete vault above grade onsite.	Yes	Potentially feasible.
	OFFSITE DISPOSAL		
	RCRA Landfill. Transport excavated landfill contents to a RCRA approved landfill. May require dewatering or solidification prior to transport.	Yes	Potentially feasible.
	TSCA Landfill. Transport excavated landfill contents to a TSCA approved landfill.	Yes	Possibly needed. TSCA permitted facility required for PCB contaminated waste (>50 mg/kg). Waste mass not analyzed yet Arochlors were possibly disposed.
Treatment	BIOLOGICAL TREATMENT		
	Aerobic Processes. Landfill contents placed in a controlled environment such as a compost pile with the addition of air to aid microbial degradation of organics.	No	Inappropriate for landfill waste mix. Physical waste handling would be infeasible.
	Anaerobic Processes. Landfill contents placed in a controlled and enclosed environment such as a digester, to allow microbial degradation in the absence of oxygen.	No	Inappropriate for landfill waste mix. Physical waste handling would be infeasible.
	Landfarming. Landfill contents spread over land in a licensed landfarm. Biological degradation with micro-organisms in aerated and nutrient rich soils.	No	Inorganic compounds may be toxic to vegetation. Not applicable to wide range of organic contaminants; and completely inappropriate for nondegradable wastes such as metal refuse and plastics.
	PHYSICAL TREATMENT		
	Adsorption. Mix adsorbent material with landfill contents or sediment to concentrate or immobilize contaminants.	No	Not appropriate for all contaminants. Not applicable to waste mix at the site. Does not chemically immobilize contaminants.
	Aeration. Inject air into landfill contents to drive off volatile and semivolatile compounds.	No	Not applicable to chemical mix found onsite.

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
	CHEMICAL TREATMENT		
	Chemical Degradation. Add oxidizing, reducing, or polymer agents to result in the breakdown of contaminants.	No	Inapplicable to both inorganic and organic contaminants found at the site.
	Neutralization. Introduce substances into the waste to reduce acid or base ions.	No	Not applicable to waste type or contaminants at the site.
	Dechlorination. Chemical reagents (usually sodium) used to strip chlorine atoms from chlorinated hydrocarbons.	No	Not applicable for inorganic contaminants or most of the organic contaminants found onsite.
	Solvent Extraction. Solvent is introduced into a contactor where it mixes with soil and elutriate	No	May add additional contamination through solvent addition. Also, waste handling and volume of waste at the site may render this option impractical.
	INCINERATION OR THERMAL DESTRUCTION		
	Wet Air Oxidation. Oxidation of wastes in a reactor under high temperature and pressure.	No	Not appropriate. Limited to liquid wastes and sludges.
	Rotary Kiln. Combustion of solids in a horizontally rotating cylinder designed for uniform heat transfer.	Yes	Potentially feasible. Possibly practical thermal destruction technique for landfill waste mass because of relatively less stringent size reduction constraints. Several commercial units are available.
	Electric Reactor. Landfill contents fed into a high temperature electric reactor which uses radiant heat and pyrolysis to destroy contaminants.	No	Not appropriate thermal destruction technique for dissimilar waste and debris because of relatively tight size reduction constraints.
	Multiple Hearth. Combustion of wastes moving slowly through vertically stacked hearths.	Yes	Potentially feasible. (Similar screening opinions as Rotary Kiln above.)
	Fluidized Bed. Landfill contents added to hot agitated bed of sand where heat transfer and combustion occur.	No	Not appropriate thermal destruction technique for mixed landfill waste because of relatively stringent size reduction constraints.

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Treatment (Cont'd)	Molten Salt Reactor. Landfill contents fed into furnace with a molten salt bed acting as a catalyst and dispersing medium for destroying wastes by oxidation.	No	Laboratory stage of development. No commercial unit available. Solids must be reduced to small size before fed to reactor.
	Plasma Arc. Destruction of contaminants using high energy free electrons for molecular fracture.	No	No commercial units available. Applicable to liquids not bulk solids.
In Situ Treatment	BIOLOGICAL TREATMENT		
	Bioreclamation. Landfill contents seeded with microorganisms native to the site, nutrients, and oxygen to enhance biological degradation..	No	Not a practical method with the waste volume and mix at the site. May be effective for some base neutrals, but inorganics may be toxic or inhibitory to organisms.
	Bioharvesting. Use of plant and animal species to accumulate contaminants in their tissues; species are harvested and disposed of.	No	Not a practical method with the waste volume and mix at the site. May be effective for some base neutrals, but inorganics may be toxic to organisms.
	Air/Oxygen Injection. Introduction of air to enchance aerobic biological activity.	No	Not a practical method with the waste volume and mix at the site. May be effective for some base neutrals, but inorganics may be toxic to microorganisms.
	PHYSICAL TREATMENT		
	Soil Aeration. Introduction of air to transfer volatile and semivolatile organic compounds from soil to air.	No	Not a practical method with the waste volume and mix at the site. Not applicable to chemicals found onsite.
In Situ Treatment	Adsorption. Landfill contents mixed with adsorbent material which will concentrate or immobilize contaminants.	No	Not a practical method with the waste volume and mix at the site.
	Soil-Vapor Extraction. Removal of volatile organic compounds from the unsaturated soil zone by application of a vacuum on a system of wells.	No	Not a practical method with the waste volume and mix at the site. Not applicable to contaminants at the site (base/neutral organic compounds and metals).

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
In Situ Treatment (Cont'd)	Vitrification. Contaminated landfill contents are fused into a glassy stable matrix by heating them in place with an electric current.	No	Not demonstrated for heterogeneous landfill material containing large amounts of conductive material. High probability of causing uncontrolled combustion because of high-BTU waste masses.
	CHEMICAL TREATMENT		
	Chemical Degradation. Add oxidizing, reducing or polymer agent to result in the breakdown of contaminants.	No	Inapplicable to both inorganic and organic types of wastes onsite. Added chemical may pose a threat of additional groundwater contamination.
	Solvent Extraction. Application of solvent either via surface flooding or injection and collection of elutriate at extraction wells followed by treatment.	No	May be effective for inorganics; however, site conditions inhibit flushing capabilities. Solvent may become a groundwater contaminant.
	Photolysis. Photodegradation of landfill contents contaminants via solar energy and the application of polar solvents.	No	Shallow penetration depth not applicable to deep landfill. Only applicable for some organic compounds.

Table 3-3 (Page 1 of 3)
APPLICABLE TECHNOLOGIES AND PROCESS OPTIONS FOR THE COSHOCTON LANDFILL/GROUNDWATER AND GAS

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Leachate/Groundwater Collection	WELLS Use of numerous regularly spaced wells to prevent horizontal migration of leachate/groundwater from the bottom of the landfill at the Middle Kittanning clay.	No	The Middle Kittanning clay and underlying shale are low-yield units with some degree of fracture flow expected. Wells are not practical for interception in these materials.
	DRAINS Use of a continuous trench filled with gravel to form a preferred flow path for intercepted leachate/groundwater.	Yes	Media drain is practical and effective in the fractured clay and shale expected at the toe of the landfill waste mass.
Leachate/Groundwater Onsite Treatment	BIOLOGICAL TREATMENT Aerobic. Leachate/groundwater mixed with a concentrated population of microorganisms and oxygen to promote biological decomposition.	Yes	May be applicable to both typical landfill pollutants and some HSL organic compounds.
	Anaerobic. Leachate/groundwater mixed with a concentrated population of anaerobic microorganisms in the absence of oxygen to promote biological degradation.	No	Anaerobic treatment is impractical for dilute low-temperature liquids treatment.
	PHYSICAL/CHEMICAL Precipitation. Alteration of chemical equilibria to reduce solubility of target constituents and remove by precipitation from solution.	Yes	Potentially feasible.
	Stripping. Mixing of liquid with air or steam to drive volatile constituents into vapor phase for removal.	No	Stripping is not applicable to organic constituents observed.
	Adsorption. Passing liquid over solid media to allow constituents to sorb onto the active sites of the solid media for removal.	Yes	Potentially feasible
	Oxidation/Reduction. Chemical breakdown of organic compounds or valance change of inorganic constituents to promote destruction or removal.	No	Not demonstrated for the contaminants identified in leachate/groundwater.
	Membrane Separation. Physical removal by diffusion through a semipermeable membrane.	No	Not practical for dilute solutions as expected in the landfill leachate/groundwater.

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Leachate/Groundwater Onsite (Continued)	Ion Exchange. Physical removal of ionic constituents by passing liquid over media which exchanges innocuous ions for target ions.	Yes	Potentially feasible
	Evaporation. Separation of water from constituents by transfer of water to vapor phase, leaving target constituents in a concentrated form.	Yes	Potentially feasible.
	Photolysis. Chemical degradation of organic constituents by light energy, commonly applied with ultraviolet light.	No	Not demonstrated for the constituents observed in leachate/groundwater.
	Filtration. Physical removal of suspended particulates by passage of liquid through granular media that entraps particulates.	No	Suspended solids are not a problem. Filtration not applicable.
Leachate/Groundwater Offsite Treatment	POTW Use of the publically-owned wastewater treatment works (POTW) to remove and manage the constituents in leachate and groundwater.	Yes	Potentially feasible
	RCRA FACILITY Use of a RCRA-permitted facility to remove and manage the constituents in leachate and groundwater.	Yes	Potentially feasible
Leachate/Groundwater Discharge	SURFACE OUTFALL Discharge of properly treated leachate/ groundwater to receiving stream at the site.	Yes	Potentially feasible
	DEEP WELL INJECTION Discharge of leachate/groundwater to a deep (possibly saline) bedrock aquifer for disposal.	Yes	Potentially feasible
Gas Collection	VERTICAL WELLS Use of vertical wells installed into the waste mass or the perimeter in granular backfilled media to extract vapor by negative pressure through a manifold collection system and blower.	Yes	Potentially feasible

Table 3-3 (Page 3 of 3)

General Response Action	Remedial Technology and Process Option	Retained for Further Analysis	Applicability Screening Comments
Gas Collection (Continued)	HORIZONTAL COLLECTORS Use of horizontal perforated pipes installed immediately below an impervious cap to extract vapor by negative pressure through a manifold collection system and blower.	Yes	Potentially feasible
Gas Treatment	THERMAL TREATMENT Use of high temperature and retention time to chemically decompose organic constituents to less harmful constituents.	Yes	Potentially feasible.
	ADSORPTION Passage of gas through a porous solid media or liquid media to sorb constituents onto active sites of the solid media.	Yes	Potentially feasible

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Table 4 (Page 1 of 8)
COMPLIANCE WITH APPLICA OR RELEVANT AND APPROPRIATE
LAWS, REGULATIONS, AND STANDARDS

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
FEDERAL			
Resource Conservation and Recovery Act (RCRA)	RCRA Subtitle C, 40 CFR 260, et seq.	RCRA regulates the generation, transport, storage, treatment, and disposal of hazardous waste. CERCLA specifically requires (in Section 104(c)(3)(B)) that hazardous substances generated from remedial actions be disposed of at facilities in compliance with Subtitle C of RCRA.	None. No hazardous waste would be removed from the site.
RCRA Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	RCRA Section 3004, 40 CFR 264 and 265	Regulates the construction, design, monitoring, operation, and closure of hazardous waste facilities.	AA-4 and AA-5. The capping systems with gas and leachate collection would comply with the regulations for closure of an existing facility.
Standards Applicable to Transporters of Hazardous Waste	RCRA Section 3003, 40 CFR 262 and 263, 49 CFR 170 to 179	Establishes the responsibility of transporters of hazardous waste in the handling, transportation, and management of the waste. Requires a manifest, recordkeeping, and immediate action in the event of a discharge of hazardous waste.	None. No hazardous substances would be transported from the site.
EPA Administered Permit Programs: The Hazardous Waste Permit Program	RCRA Section 3005, 40 CFR 270, 124	Covers permitting, application, monitoring, and reporting requirements for hazardous waste management facilities.	AA-2 through AA-5. All action alternatives would include monitoring sufficient to meet RCRA requirements.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Hazardous and Solid Waste Amendments (HSWA) of 1984 (1984 amendments to RCRA)	PL 98-616, Federal Law 71:3101, 40 CRF 264	The currently applied form of the "Land Disposal Ban" (effective May 8, 1985) prohibits the direct placement of any bulk or noncontainerized liquid hazardous waste in landfills. These rules will also restrict the landfilling of most RCRA-listed wastes by 1991 unless the U.S. EPA promulgates applicable treatment standards for these wastes (40 CFR 264.314).	None. Provisions of HSWA do not apply to onsite landfill closure and postclosure monitoring.
Toxic Substances Control Act (TSCA)	40 CFR Part 761	Applies to the disposal of liquid waste containing PCB concentrations at or greater than 50 ppm and PCB's that have migrated from the original source of contamination. PCB concentrations greater than 500 ppm must be incinerated in an incinerator that complies with 40 CFR 761.70. PCB's less than 500 ppm and greater than 50 ppm may be disposed of in a landfill that complies with 40 CFR 761.75.	Waste disposal records indicate that PCB's may have been disposed of at site. RI data did not show PCB releases.
Statement of Procedures on Flood Plain Management and Wetland Protection	Appendix A to 40 CFR 6, Executive Order 11988, and 11990	Requires federal agencies to avoid wherever possible adversely affecting flood plains or wetlands and to evaluate potential effects of planned actions in these designated areas.	None. Site is not in a wetland or floodplain.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Safe Drinking Water Act Maximum Contaminant Limits (MCL's)	Safe Drinking Water Act, 40 CFR 141 through 143	The Interim MCL's are enforceable standards for ambient drinking water quality. Recommended, Proposed, and Secondary MCL's are also applicable as advisory drinking water standards.	AA-2 through AA-5. All alternatives are designed to protect existing drinking water sources from contamination by means of monitoring, leachate collection or both.
National Environmental Policy Act (NEPA)	NEPA Section 102(2)(c)	CERCLA actions are exempted from the NEPA requirements to prepare an environmental impact statement (EIS) because US EPA's decisionmaking processes in selecting a remedial action alternative are the functional equivalent of the NEPA analysis.	AA-1 through AA-5.
Intergovernmental Review of Federal Program	Executive Order 12372 and 40 CFR 29. (Replaces state and area-wide coordination process required by OMB Circular A-95.)	Requires state and local coordination and review of proposed EPA-assisted projects. The EPA Administrator is required to communicate with state and local officials to explain the project, consult with other affected federal agencies, and provide a comment period for state review.	AA-1 through AA-5.
National Pollutant Discharge Elimination System (NPDES) Permit	CWA Section 402, 40 CFR 122, 123, 125 Subchapter N	Regulates point source discharge of water into public surface waters.	AA-4 and AA-5.
Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403 Subchapter N, FWPCA	Regulates the quality of water discharged into publicly owned treatment works (POTW).	AA-4 and AA-5.
Toxic Pollutant Effluent Standards	40 CFR 129	Regulates the discharge of the following pollutants: aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, and PCB's.	

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Occupational Safety and Health Act (OSHA)	29 CFR 1910	Regulates working conditions to assure safety and health of workers.	AA-3, AA-4, and AA-5. This applies to all workers on the site property during excavations, construction, and operation of facilities.
STATE			
Ohio NPDES Permit	OAC 3745-31-05 (A)(3)	Establishes criteria for decision by OEPA Director on discharge permits. Requirement specifies BAT to be applied on new permits.	Possibly AA-4 and AA-5. Direct surface water discharge of collected leachate/groundwater may be possible after treatment.
Ohio NPDES Permit	Ohio Administrative Code: 3745-33-01 through 3745-33-10. Authority granted by Ohio Water Pollution Control Act, ORC 6111.03.	Regulates point source discharges to surface waters of the State. Establishes terms for the receipt and maintenance of discharge permit.	Possibly AA-4 and AA-5. Direct surface water discharge of collected leachate/groundwater may be possible after characterization or following treatment.
Ohio Water Quality Standards	Ohio Administrative Code: 3745-1. Authority granted by Ohio Water Pollution Control Act, ORC 6111.041.	Establishes water quality criteria applicable to all waters.	AA-2 through AA-5.
Ohio Pretreatment Regulations	Ohio Administrative Code: 3745-3 Authority granted by Ohio Water Pollution Control Act, ORC 6111.03.	Regulates the introduction of pollutants into POTW's by industrial users.	Possibly AA-4 and AA-5. Pretreatment may be needed to reduce concentrations of substances that would pass through, interfere or cause discharge of toxics in toxic amounts from the POTW.
Ohio Water Pollution Control Act	Ohio Revised Code: 6111.01 to 6111.08	Prohibits discharge of waste which violates water quality standards or effluent limitations.	AA-4 and AA-5.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Ohio State Construction Permit	Ohio Water Pollution Control Act, Ohio Revised Code: 6111.03	Authorizes issuance of permits for installation or modification of disposal systems.	AA-4 and AA-5.
Ohio General and Miscellaneous Air Pollution Regulations	Ohio Administrative Code: 3745-15-04	Provides authority to require measurement of the emission of air contaminants from any source.	AA-4 and AA-5.
	Ohio Administrative Code: 3745-15-07	Prohibits the release of contaminants into the open air in amounts which endanger the public.	AA-4 and AA-5.
	Ohio Administrative Code: 3745-15-08	Prohibits the use of dilution to meet air emission requirements.	AA-4 and AA-5.
Ohio Air Pollution Control Laws	Ohio Revised Code: 3704.03	Authorizes adoption of ambient air quality standard and air emission standards; grants authority to issue permits for installation and operation of any air contaminant source or emission control device; provides authority to require monitoring of air contaminant source; grants site access; and provides authority to require air emission controls.	AA-4 and AA-5.
Ohio Regulation on Air Permits to Operate and Variances	Ohio Administrative Code: 3745-35	Outlines application procedures and term and conditions of operating permit for air contaminant source; describes procedure for obtaining variance.	AA-4 and AA-5.
Ohio Solid Waste Disposal Regulations	Ohio Administrative Code: 3745-27-06(B) 3745-27-09(G)	Requires all monitoring wells to conform to Chapter 3745-9 of the Regulations of the Ohio EPA and semi-annual monitoring for chlorides, COD, TOC, TDS, and methylene blue active substances (MBAS). Other parameters may be added at the request of the OEPA Director as deemed to be required.	AA-2 through AA-5.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
	Ohio Administrative Code: 3745-27-06(H)	Describes criteria to be used to evaluate solid waste facility construction permit.	AA-3, AA-4, and AA-5.
	Ohio Administrative Code: 3745-27-06(I)	Criteria for siting solid waste facility.	None. The site already is a solid waste facility.
	Ohio Administrative Code: 3745-27-09 and 3745-27-10	Closure requirements for solid waste facility.	AA-3, AA-4, and AA-5.
Ohio Solid and Hazardous Waste Disposal Law	Ohio Revised Code: 3734.02	Grants rulemaking, permitting, and enforcement authority.	AA-2 through AA-5.
	Ohio Revised Code: 2734.02(H)	Prohibits earthwork and construction, on land where a hazardous waste facility or a solid waste facility which received significant amounts of hazardous waste was operated, without prior authorization.	AA-3 through AA-5.
	Ohio Revised Code: 3734.02(J)	Grants authority to issue an emergency permit to treat, store, or dispose of hazardous waste at an unlicensed location where imminent and substantial danger to the public is present.	None.
	Ohio Revised Code: 3734.05(C)	Creates Hazardous Waste Facility Board and defines criteria to be used for evaluating installation and operating permits.	None.
	Ohio Revised Code: 3734.12(D)	Provides authority to develop performance standards for hazardous waste treatment, storage, and disposal permits.	AA-2 through AA-5.
	Ohio Revised Code: 3734.12(H)	Grants authority to prohibit disposal of specific hazardous waste in state.	None. All wastes are already onsite. No new wastes would be brought to the site.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Ohio Hazardous Waste Management Regulations	Ohio Administrative Code: 3745-50	Provides definition of terms, permit information and overview information applicable to the hazardous waste rules.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-51	Identifies wastes subject to regulation as hazardous wastes.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-52	Establishes standards for generators of hazardous waste.	None. Hazardous waste would not be generated.
	Ohio Administrative Code: 3745-53	Establishes standards for transporters of hazardous waste.	Possibly AA-4 and AA-5 because of transport of collected leachate/ groundwater.
	Ohio Administrative Code: 3745-54	Minimum standards which define acceptable management of hazardous waste. Standards include criteria for security, inspections, personnel training, location, communication, emergency services, contingency plans, emergency procedures, groundwater protection, corrective action, and recordkeeping.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-54-92 through 3745-54-94	Hazardous waste facility groundwater protection standards and concentration limits.	AA-2 and AA-5.
	Ohio Administrative Code: 3745-68-10	Closure and postclosure care requirements for hazardous waste landfills.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-66	Closure and postclosure requirements for a hazardous waste facility.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-55-70 through 3745-57-51	Defines operating requirements for containers, tanks, surface impoundments, piles, land treatment, landfills, and incinerators.	AA-2 through AA-5.

Law, Regulation, or Standard	Source of Regulation	Applicability or Relevance and Appropriateness	Alternative Affected
Ohio Permit System Regulations	Ohio Administrative Code: 3745-31-02	Grants authority to issue construction permits for installation or modification of air contaminant sources, wastewater treatment systems, and solid waste disposal facilities.	AA-2 through AA-5.
	Ohio Administrative Code: 3745-31-05	Defines criteria for evaluating installation and operation of air contaminant sources, solid waste disposal facilities, and water pollution sources, and treatment systems.	AA-2 through AA-5.

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Table 5-1
SUMMARY OF COMPLIANCE WITH
FEDERAL AND STATE ARARs

Selected Remedial Action	Chemical-Specific ARARs	Action-Specific ARARs	Location-Specific ARARs
1. Site fencing and posting	None	Ohio solid waste landfill closure OAC 3745-27-10; Ohio hazardous waste landfill and post-closure care OAC 3745-68.	None
2. Attachment of restricted use note to deed or title	None	Ohio hazardous waste facility post-closure planning and care OAC 3745-66-20 RCRA 40CFR264.116 and 40CFR264.117.	None
3. Site grading	None	OAC 3745-27-10; OAC 3745-68-10	None
4. Site capping with clay and soil to a permeability less than the natural base material	None	OAC 3745-27-10; OAC 3745-68-10 RCRA 40CFR264.310	None
5. Landfill gas collection and venting	Air pollution nuisances prohibition OAC 3745-15-07	OAC 3745-27-10; OAC 3745-68-10	None
6. Leachate/groundwater collection and onsite storage	None	OAC 3745-27-10; OAC 3745-68-10	
7. Offsite leachate/groundwater treatment at the POTW	POTW Pretreatment regulations OAC 3745-03-01	Ohio POTW Pretreatment regulations OAC 3745-03-01.	None
8. Monitoring groundwater, collected leachate/ groundwater and gas	Hazardous waste facility standards OAC 3745-54	Solid waste facility monitoring OAC 3745-27-10; Hazardous waste facility groundwater monitoring OAC 3745-65-90+; OAC 3745-68-10; and hazardous waste facility standards OAC 3745-54.	None

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TABLE C-1
DETAILED CAPITAL COST ESTIMATE
(Page 1 of 2)

AA-1: NO ACTION (Capital Costs not applicable)
AA-2: SITE RESTRICTIONS
AA-3: SITE GRADING
AA-4: SOIL AND CLAY CAPPING
AA-5: SOIL, SYNTHETIC MEMBRANE, AND CLAY CAPPING

ITEM #	DESCRIPTION	UNITS	QUANTITIES AA-2	AA-3	AA-4	AA-5	UNIT COSTS ($/UNIT)	ITEM COST ESTIMATE TOTALS AA-2 ($)	AA-3 ($)	AA-4 ($)	AA-5 ($)
1	CLEAR AND GRUB	ACRE	0	15	15	15	$2,880	$0	$43,200	$43,200	$43,200
2	LEACHATE COLLECTION										
	a PIPING	LF	0	0	5,300	5,300	$42	$0	$0	$223,000	$223,000
	a COLLECTION	LS	0	0	1	1	$192,000	$0	$0	$192,000	$192,000
	a STORAGE	LS	0	0	1	1	$50,000	$0	$0	$50,000	$50,000
3	SITE DEWATERING AND EROSION PROTECTION	LS	0	1	1	1	$20,000	$0	$20,000	$20,000	$20,000
4	SITE GRADE AND FILL	CY	0	220,000	220,000	220,000	$15.6	$0	$3,430,000	$3,430,000	$3,430,000
5	GAS COLLECTION		0								
a	4" PERF PIPE	LF	0	0	9,000	9,000	$29.7	$0	$0	$267,000	$267,000
b	8" HEADER PIPE	LF	0	0	3,000	3,000	$26.4	$0	$0	$79,200	$79,200
c	2" DRAIN PIPE	LF	0	0	1,000	1,000	$5.5	$0	$0	$5,500	$5,500
d	VENT	EACH	0	0	7	7	$1,000	$0	$0	$7,000	$7,000
6	CLAY BARRIER	CY	0	0	113,000	113,000	$18.2	$0	$0	$2,060,000	$2,060,000
7	GEOMEMBRANE										
a	SMOOTH	SY	0	0	0	140,400	$7.2	$0	$0	$0	$1,010,000
b	ROUGH	SY	0	0	0	29,000	$8.2	$0	$0	$0	$238,000
8	DRAINAGE COLLECT	LF	0	0	15,000	15,000	$11.9	$0	$0	$179,000	$179,000
9	DRAINAGE SAND	CY	0	0	85,000	85,000	$14.0	$0	$0	$1,190,000	$1,190,000
10	GEOTEXTILE	SY	0	0	169,400	169,400	$1.5	$0	$0	$249,000	$249,000
11	SOIL COVER	CY	0	0	85,000	85,000	$9.0	$0	$0	$765,000	$765,000
12	ASPHALT DITCH	LF	0	0	2,300	2,300	$18.7	$0	$0	$42,900	$42,900
13	TOPSOIL	CY	0	32,000	32,000	32,000	$8.0	$0	$256,000	$256,000	$256,000
14	HYDROSEED	ACRE	0	40	40	40	$1,400	$0	$56,000	$56,000	$56,000
15	FENCE	LF	13,000	13,000	13,000	13,000	$12.0	$156,000	$156,000	$156,000	$156,000
16	DEED RESTRICTIONS	LS	1	1	1	1	$20,000	$20,000	$20,000	$20,000	$20,000
17	HEALTH AND SAFETY	MANHOURS	0	1,000	2,000	2,500	$23.0	$0	$23,000	$46,000	$57,500
18	GAS VALVES	EACH	0	0	15	15	$1,000	$0	$0	$15,000	$15,000
	CONSTRUCTION SUBTOTALS							$176,000	$4,000,000	$9,350,000	$10,600,000

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*: TABLEA.WK1 CREATED: 02-Jul-87 REVISED 03-Dec-87

TABLE C-1 (Page 2 of 2)
DETAILED CAPITAL COST ESTIMATES

AA-1: NO ACTION (Capital Costs not applicable)
AA-2: SITE RESTRICTIONS
AA-3: SITE GRADING
AA-4: SOIL AND CLAY CAPPING
AA-5: SOIL, SYNTHETIC MEMBRANE, AND CLAY CAPPING

ITEM #	ITEM DESCRIPTION	COST ESTIMATES AA-2 (a)	AA-3 (a)	AA-4 (a)	AA-5(a)
19	CONSTRUCTION SUBTOTAL (From Page 1 of 2)	$176,000	$4,000,000	$9,350,000	$10,600,000
20	MOBE./DEMOBE. AND TEMPORARY FACILITIES AT 8%	$14,100	$320,000	$748,000	$848,000
21	BID CONTINGENCY AT 15%	$28,500	$648,000	$1,510,000	$1,720,000
22	SCOPE CONTINGENCY AT 20%	$38,000	$864,000	$2,020,000	$2,290,000
23	TOTAL CONSTRUCTION COST ESTIMATE	$257,000	$5,830,000	$13,600,000	$15,500,000
24	PERMIT & LEGAL SERVICE AT 5% PLUS OTHER FACTORS	$87,900	$292,000	$775,000	$775,000
	SERVICE DURING CONSTRUCTION AT 7% PLUS OTHER FACTORS	$18,000	$408,000	$952,000	$1,090,000
25	BOND AT 1%	$2,570	$58,300	$136,000	$155,000
26	TOTAL IMPLEMENTATION COST ESTIMATE	$365,000	$6,590,000	$15,500,000	$17,500,000
27	ENGINEERING COST ALLOWANCE	$61,500	$494,000	$780,000	$880,000
	TOTAL CAPITAL COST ESTIMATE	$427,000	$7,080,000	$16,300,000	$18,400,000

NOTE: (a) Capital cost estimates are considered order-of-magnitude level and have an expected accuracy of plus 50 percent to minus 30 percent. All estimates rounded to 3 significant figures.

TABLE C-2

OPERATION AND MAINTENANCE (ANNUAL)
ORDER-OF-MAGNITUDE COST ESTIMATES

AA-1 NO ACTION (O&M Costs not applicable)
AA-2 SITE RESTRICTIONS
AA-3 SITE GRADING
AA-4 SOIL AND CLAY CAPPING
AA-5 SOIL, SYNTHETIC MEMBRANE, AND CLAY CAPPING

DESCRIPTION	AA-2 (a)	AA-3 (a)	AA-4 (a)	AA-5 (a)
POWER	$0	$600	$2,100	$2,100
SITE INSPECTION	$0	$0	$1,500	$1,500
PROPANE/GAS	$0	$0	$600	$600
MONITORING	$50,000	$50,000	$45,000	$45,000
GRASS/BRUSH CONTROL	$600	$5,000	$5,000	$5,000
LEACHATE COLLECT/TREAT SYSTEM	$0	$0	$28,500	$28,500
MISCELLANEOUS REPAIRS	$5,000	$10,000	$20,000	$20,000
O&M CONTINGENCY AT 25%	$13,900	$16,400	$26,000	$26,000
TOTAL O&M COST ESTIMATES	$69,500	$82,000	$129,000	$129,000

NOTE: (a) O&M cost estimates are considered order-of-magnitude level and have an expected accuracy of plus 50 percent to minus 30 percent.
All estimates rounded to 3 significant figures.

FILE: TABLEB.WK1 CREATED: 02-Jul-87 REVISED 03-Dec-87

TABLE C-3

COSHOCTON LANDFILL CLOSURE
OPERATIONS AND MAINTENANCE PRESENT WORTH COSTS FOR
20, 30, 40, 50, AND 100 YEAR TIME PERIODS AT
3%, 5%, AND 10% RATES

AA-1 NO ACTION (O&M Costs not applicable)
AA-2 SITE RESTRICTIONS
AA-3 SITE GRADING
AA-4 SOIL AND CLAY CAPPING
AA-5 SOIL, SYNTHETIC MEMBRANE, AND CLAY CAPPING

ASSEMBLED ALTERNATIVE	ANNUAL O&M COST ESTIMATE(a)	20 YEARS(a)			30 YEARS(a)			40 YEARS(a)		
		3%	5%	10%	3%	5%	10%	3%	5%	10%
AA-2	$69,500	$1,030,000	$866,000	$591,000	$1,360,000	$1,070,000	$655,000	$1,610,000	$1,190,000	$680,000
AA-3	$82,000	$1,220,000	$1,020,000	$698,000	$1,610,000	$1,260,000	$773,000	$1,900,000	$1,410,000	$802,000
AA-4	$129,000	$1,920,000	$1,610,000	$1,100,000	$2,530,000	$1,980,000	$1,220,000	$2,980,000	$2,210,000	$1,260,000
AA-5	$129,000	$1,920,000	$1,610,000	$1,100,000	$2,530,000	$1,980,000	$1,220,000	$2,980,000	$2,210,000	$1,260,000

ASSEMBLED ALTERNATIVE	ANNUAL O&M COST ESTIMATE(a)	50 YEARS(a)			100 YEARS(a)		
		3%	5%	10%	3%	5%	10%
AA-2	$69,500	$1,790,000	$1,270,000	$689,000	$2,200,000	$1,380,000	$695,000
AA-3	$82,000	$2,110,000	$1,500,000	$813,000	$2,590,000	$1,630,000	$820,000
AA-4	$129,000	$3,320,000	$2,360,000	$1,280,000	$4,080,000	$2,560,000	$1,290,000
AA-5	$129,000	$3,320,000	$2,360,000	$1,280,000	$4,080,000	$2,560,000	$1,290,000

NOTE: (a) O&M cost estimates are considered order-of-magnitude level and have an expected accuracy of plus 50 percent to minus 30 percent.
All values rounded to 3 significant figures.

FILE: TABC.WK1 CREATED: 06-Jul-87 REVISED 03-Dec-87

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TABLE C-4

COSHOCTON LANDFILL CLOSURE
PRESENT WORTH COSTS CALCULATED FOR
20, 30, 40, 50, AND 100 YEAR TIME PERIODS AT
3%, 5%, AND 10% RATES

AA-1 NO ACTION (Present Worth not applicable)
AA-2 SITE RESTRICTIONS
AA-3 SITE GRADING
AA-4 SOIL AND CLAY CAPPING
AA-5 SOIL, SYNTHETIC MEMBRANE, AND CLAY CAPPING

ASSEMBLED ALTERNATIVE	CAPITAL COST ESTIMATE(a)	ANNUAL O&M COST ESTIMATE(a)	20 YEARS(a)			30 YEARS(a)			40 YEARS(a)		
			3%	5%	10%	3%	5%	10%	3%	5%	10%
AA-2	$427,000	$69,500	$1,460,000	$1,290,000	$1,020,000	$1,790,000	$1,500,000	$1,080,000	$2,030,000	$1,620,000	$1,110,000
AA-3	$7,080,000	$82,000	$8,300,000	$8,100,000	$7,780,000	$8,690,000	$8,340,000	$7,850,000	$8,980,000	$8,490,000	$7,880,000
AA-4	$16,300,000	$129,000	$18,200,000	$17,900,000	$17,400,000	$18,800,000	$18,300,000	$17,500,000	$19,100,000	$18,500,000	$17,600,000
AA-5	$18,400,000	$129,000	$20,300,000	$20,000,000	$19,500,000	$20,900,000	$20,400,000	$19,600,000	$21,400,000	$20,600,000	$19,700,000

ASSEMBLED ALTERNATIVE	CAPITAL COST ESTIMATE(a)	ANNUAL O&M COST ESTIMATE(a)	50 YEARS(a)			100 YEARS(a)		
			3%	5%	10%	3%	5%	10%
AA-2	$427,000	$69,500	$2,220,000	$1,700,000	$1,120,000	$2,620,000	$1,810,000	$1,120,000
AA-3	$7,080,000	$82,000	$9,190,000	$8,580,000	$7,890,000	$9,670,000	$8,710,000	$7,900,000
AA-4	$16,300,000	$129,000	$19,600,000	$18,700,000	$17,600,000	$20,600,000	$18,900,000	$17,600,000
AA-5	$18,400,000	$129,000	$21,700,000	$20,800,000	$19,700,000	$22,500,000	$21,000,000	$19,700,000

NOTE: (a) Present worth costs are based on order-of-magnitude cost estimates for capital and O&M. These order-of-magnitude level estimates have an expected accuracy of plus 50 percent to minus 30 percent.
All estimates rounded to 3 significant figures.

FILE: TAB8.WK1 CREATED: 02-Jul-87 REVISED 03-Dec-87